311a


LEHIGH
NEW YORK CENTRAL R. R
S T A F F O R
Stafford
908
912
915
917
936
900
965
965
995
936
937
932
Creek
Canada
1000
1005
Roanok
955
1020
LACKAWANNA AND WESTERN
East Bethany
1003
White
Black
1100
1050
1028
T H A N Y
1200
1177
1151
1042
1042

ed, as shown on the progress maps accompanying each
port of the Director.

tlas is being published in sheets of convenient size,
½ by 20 inches. The four-sided area of land repre-
an atlas sheet is bounded by parallels and meridians
alled a *quadrangle*. The quadrangles mapped cover
itude by 1° of longitude, 30′ of latitude by 30′ of
e, 15′ of latitude by 15′ of longitude, or smaller areas,
of the area mapped depending on the scale used.
scales are employed. The smallest scale, that used
drangles covering 1°, is 1:250,000, or very nearly 4
an inch—that is, 4 linear miles on the ground is
ted by 1 linear inch on the map. This scale is used
s of the desert regions and some other parts of the far
For the greater part of the country, which is mapped
drangles covering 30′, a larger scale, 1:125,000, or
miles to an inch, is employed. A still larger scale,
), or about a mile to an inch, is used for quadrangles
15′, the unit selected for mapping thickly settled or
ally important areas. A fourth scale, 1:31,680, or one-
e to an inch, is employed for maps that are to be used
ection with irrigation or drainage, and a few maps of
districts are published on still larger scales.

ographic survey of Alaska has been in progress since
d nearly 30 per cent of its entire area has now been
. One-third of the area mapped, or 10 per cent of the
y, has been covered only by reconnaissance work, the
f which have been mapped on a scale of about 10 miles
ch. The maps of nearly all the remaining two-thirds
surveyed area have been published on a scale of
00, or about 4 miles to an inch. These maps are large,
presenting 2° of latitude by 4° of longitude. A few

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slope
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9/16


BETHANY
PAVILION
Bethany
East Bethany
Canada
Roanoke
Pavilion Center
B.M.
Black
White
Creek
Oatka
Creek
DELAWARE
LACKAWANNA
AND
WESTERN
R. R.
Junc.
(ROCHESTER
DIV.)
965
900
995
937
936
932
1005
1000
1020
1003
955
951
944
912
1100
1050
1028
1042
1042
1200
1121
1177
1151
981
953
935
1060
1300
1400
1180
1085
1072
Ba1
marcellus
Stafford contact
Skaneateles (Cardiff phase)
Ba2
Centerfield
in stream bed
a lower bed with L. laura Stropholosia and bed 10-12' up
Tichenor
B3
Ba3
Ba4
Ba7
Moscow Geneseo
Ba6

314

The shale below the 10" slab, to bed contains many Streptelasma (cup corals), also R. spiriferoides and S. [illegible] and T. [illegible]. The 10" [illegible] Streptelasma but is very shaly and [illegible] different [illegible] The [illegible] will serve to orient.

~~Lichenalia~~

1½ miles SE of E.B

In [illegible] consists of a lower layer of hard gray ls. of about 15" thickness, then 1½' of shale [illegible] [illegible] fragments then 5" hard grey ls. succeeded by shale.

In the 1½' layer of sh. [illegible] Lichenalia, Streptelasma, [illegible] and other bryozoa were found.

In the 5" ls. band were seen [illegible]

The lowest layer bears the most crinoidal material there

315

315

East Bethany

July 31

316

317

318

319

July 28 1978

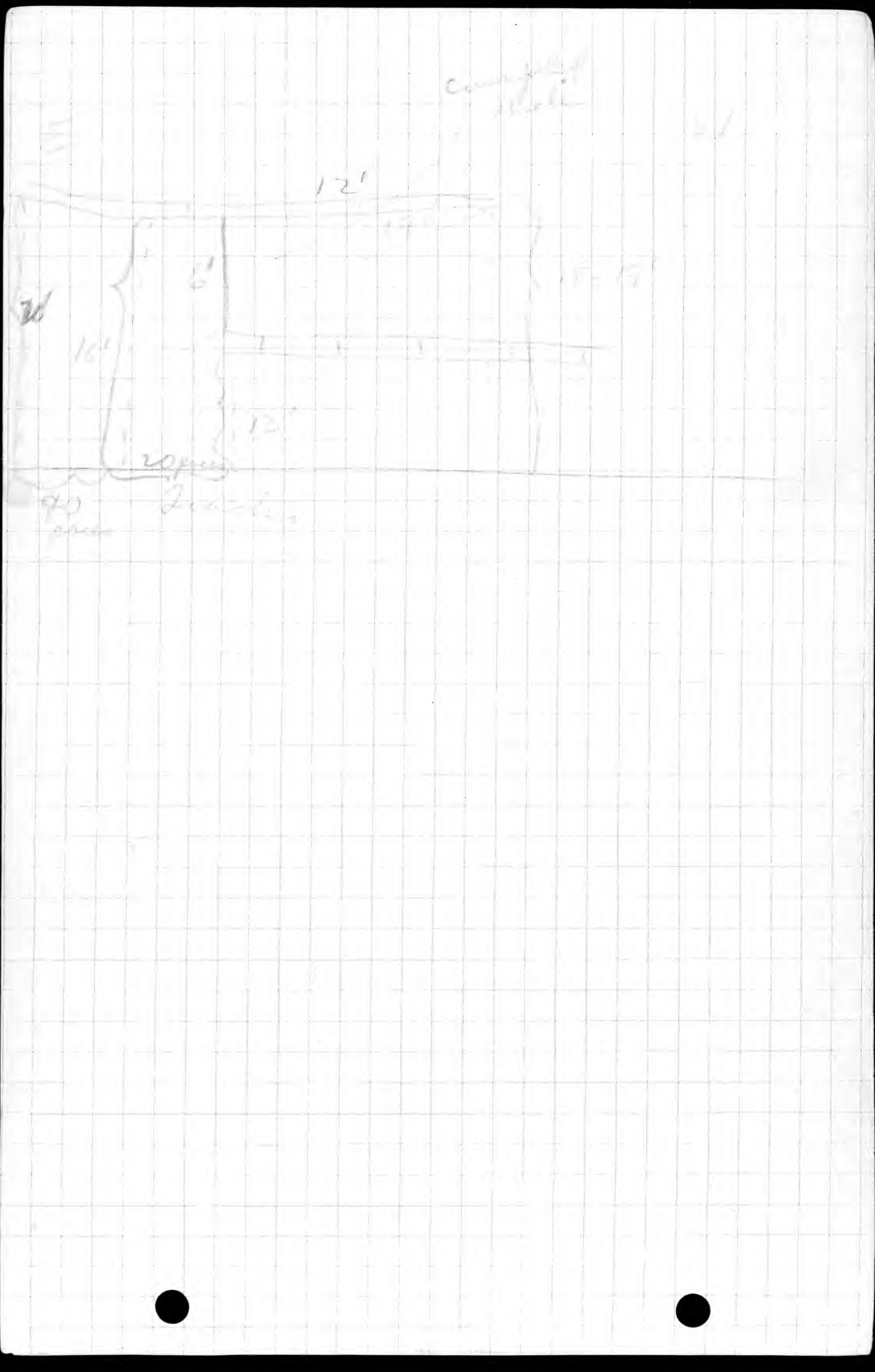
East Bethany

At the first [illegible] [illegible] [illegible] west of E. Bethany [illegible], [illegible] (CA), [illegible] [illegible] [illegible] [illegible] level [illegible] 10[illegible] 102[illegible]' [illegible] [illegible] [illegible] [illegible] [illegible]. The [illegible] [illegible] [illegible] [illegible] the banks along the [illegible] of the RR [illegible] [illegible] [illegible] [illegible] the [illegible]. The [illegible] [illegible] [illegible] [illegible] for collecting [illegible], [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] to a [illegible] yellow [illegible] [illegible] shaley [illegible] [illegible] [illegible] [illegible], fossils are [illegible] [illegible] in the shale.

[illegible] E from [illegible] RR crossing [illegible] [illegible] of a small stream at about 975' above sea level along the [illegible] bed of the stream is about 1' of soft bluish shale [illegible]. This is capped by 1' of limestone in two layers. The lower layer is hard [illegible] with [illegible] [illegible] and contains [illegible]. The upper layer is [illegible] thick of [illegible] gray [illegible] [illegible] [illegible] thins to the west. Many of the fossils are silicified and [illegible] [illegible] [illegible] weathers to a light yellow brown.

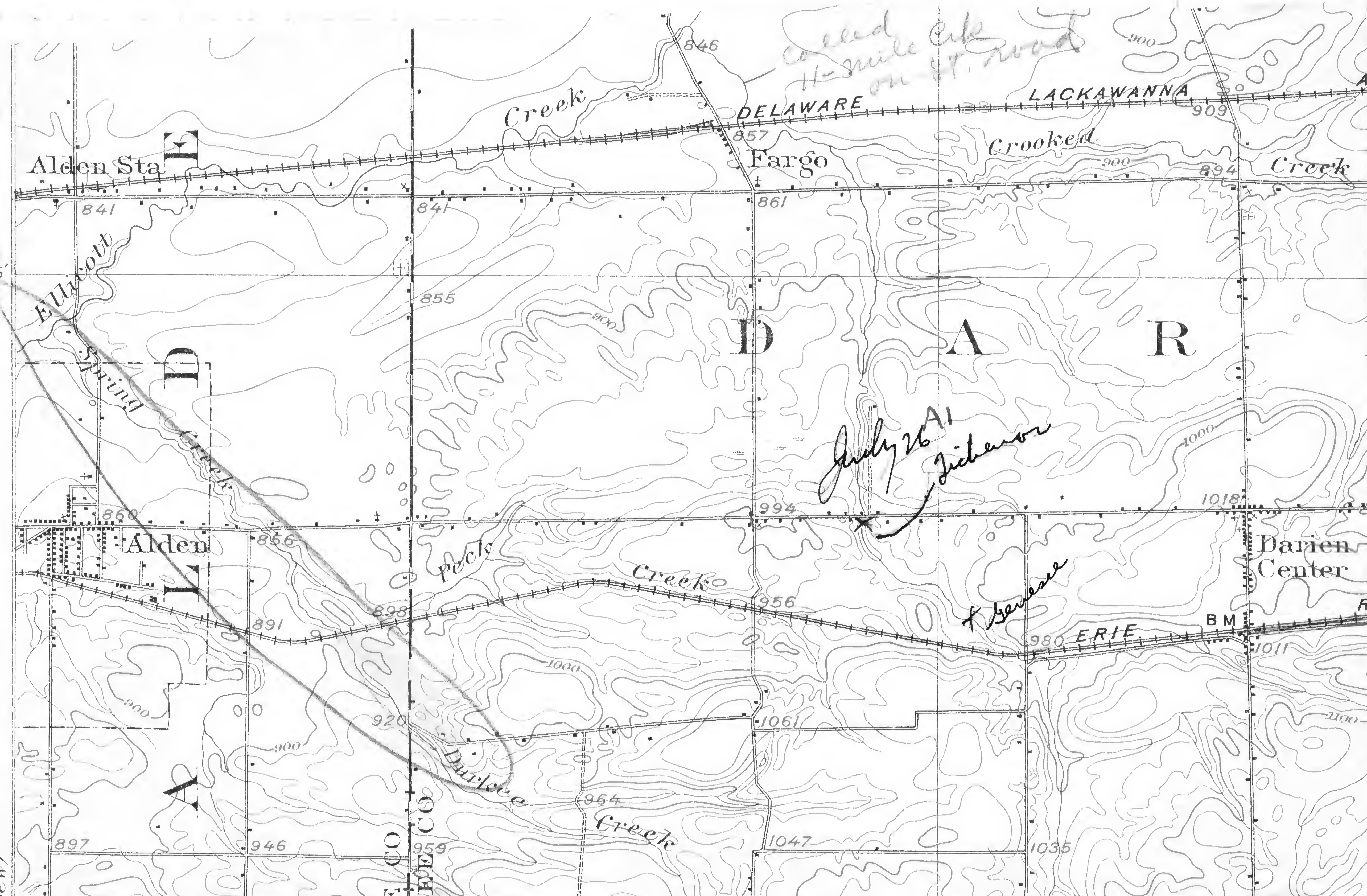
About 3' below the heavy massive layer of limestone there is weathered shale without any fossils in it. Upstream about 250 yards from the crossing of this stream and the bridge [illegible]

321



322

323



Alden Sta
Alden
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DELAWARE
LACKAWANNA
ERIE
Creek
Crooked
Creek
Ellicott
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Creek
D A R
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846
857
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841
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900
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1018
1011
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1061
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1047
1035
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897
959
909
894
1000
1100
BM
E CO
SEE CO
July 26 A1
Tiberon
+ Genesee

323a

324

325

326

327

check lock

 328

These were found about 11' below the [illegible]

[illegible]

Fauna in the Menteth —

A. spiriferoides — S. [illegible]

P. rana — R. granulosa

Elliott Creek was visited in an effort to work out the zones in the upper part of the Moscow but they could not be any more satisfactorily determined than those at Bowen Brook. The Kashong shale is clear enough but only one imperfect specimen of Ambocoelia rewarded the search for that fossil. The Windom shale seems to be very thin and a layer of limestone apparently like the Stapleton limestone occurs about 50 ft below the base of the Genesee. The base of the Moscow has the three fossiliferous layers of limestone with a fauna [illegible] of [illegible] from the [illegible] Tichenor, with which the [illegible] appears to [illegible]. The R. praeumbona beds were not seen either at Elliott creek or Menden Creek or Bowen Brook. Perhaps northward these beds have thinned out. Certainly they are in full force on Cazenovia Creek!

329

The Ambocoelia zone is close to the top of Tichenor in the exposures at Bulls Bridge and Cazenovia Creek but @ Darien it is way above it suggesting considerable overlap on my Kashong shale.

Pictures today
2 of point [illegible] Creek
1 Kashong shale Elliott Creek
1 Tichenor Elliott Creek
Trilobite bed Murder Creek
[illegible] 2 Murder Creek

One of the concretions in the band just under the Genundewah ls. contained a Leiorhynchus. S. tullius was not seen in these upper shales.

Where the Moscow shales are exposed in the banks they fall into small chips, but in the stream beds they preserve a sort of concretionary ~~structure~~
The Genundewah lies 560 paces from top of Tichenor in stream bed.

Section on the shore between Clover Banks and Avery's ravine

3' Ludlowville
6" Stropheodonta bed
12' 10"

Above the Stropheodonta bed were 3' of fissile shales soft and crumbling easily. In the clay and broken fragments 3' above Stropheodonta bed 2 spec. of P. styliophora were found and S. pennatus. These were not in place but still are not far from their origin

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417

Note on Avery's Creek.

According to Grabau the Pleurodictyum beds are exposed on Avery's Creek but at this level is not a pond. This section must have been dammed up both places quite recently, thus covering up the Pleurodictyum beds. The upper Ludlowville beds were not carefully examined as they were scattered up the stream & their exact position was difficult to determine.

Bluff at [illegible]

16' hard Ls

17' Grey ~~stone~~ shaly limestone
2' Black fissile shale
3' Black shale [illegible] [illegible] in a limestone

7' Black fissile shale

 448

The fauna about 35' below the contact with the Genesee and above a stratum of ls about 13' below the contact contains S. undulatus, Stropheodonta demissa, R. venustula, A. reticularis,

6 steps from top of 6" band
4 in. test.

7' above the 6" calcareous shale comes a band of shale that bears many corals, Heliophyllum, Cystiphyllum, Endophyllum etc., Many favosites. It is a shale mixed with ls.

20' 5" from the top of the six inch band of ls is another about 4" thick.

At 1442 paces in stream bed the rock is hard and calcareous & have Chaetetes sp. and O. undulata. On these are softer shales. These hard beds also have huge Phacops rana, H. dekayi, S. pennatus, Homalonotus

At 1490 paces Chaetetes is very abundant forming small reefs of branching form. Here also were seen T. carinatus, Cystodictya, S. pennatus, Camarotoechia, Platyceras, [illegible], A. spinigera, P. rana, C. [illegible], D. [illegible], Terebratulids, Favosites, F. [illegible],

Section at 950 paces.

Genesee

25'

5'

Shale 20' 5" (probably 26' 10')

[illegible] 2'

7' shale

6" calcareous

Stream level 6' 8"

24' ?

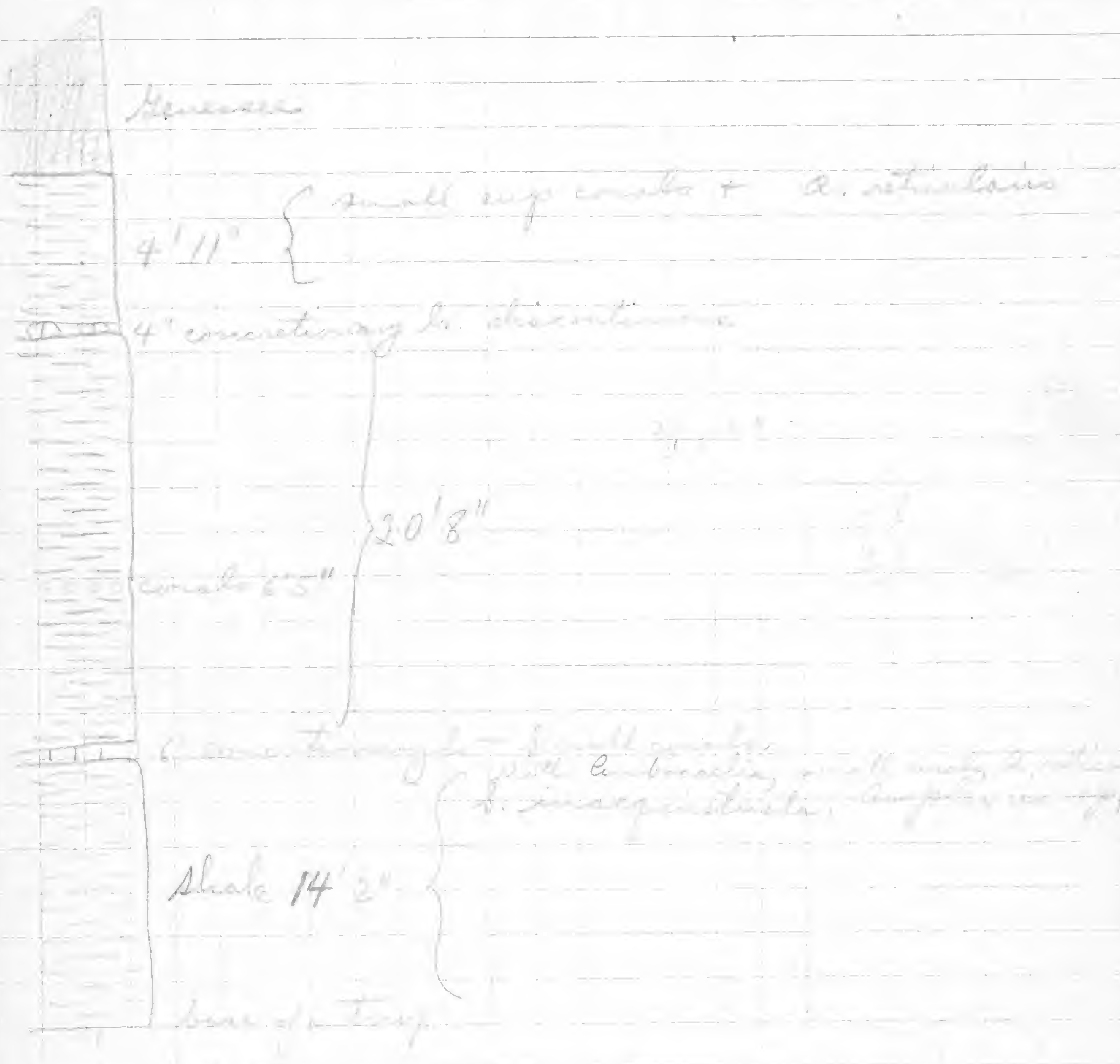
The fossils at 1490 paces are in general localized to the locality [illegible] the [illegible] [illegible] straight [illegible] in direction of the two streams at b.

147 paces upstream from intersection b was found S. [illegible]

832 paces upstream from b the following fauna was found [illegible], S. [illegible], Ambocoelia sp., C. [illegible] ?

451

Section 555 paces S. of road



Section 555 paces south.

In the 1st 5'5" of shale over the 6" band of ls are found corals (small) large Spirifers

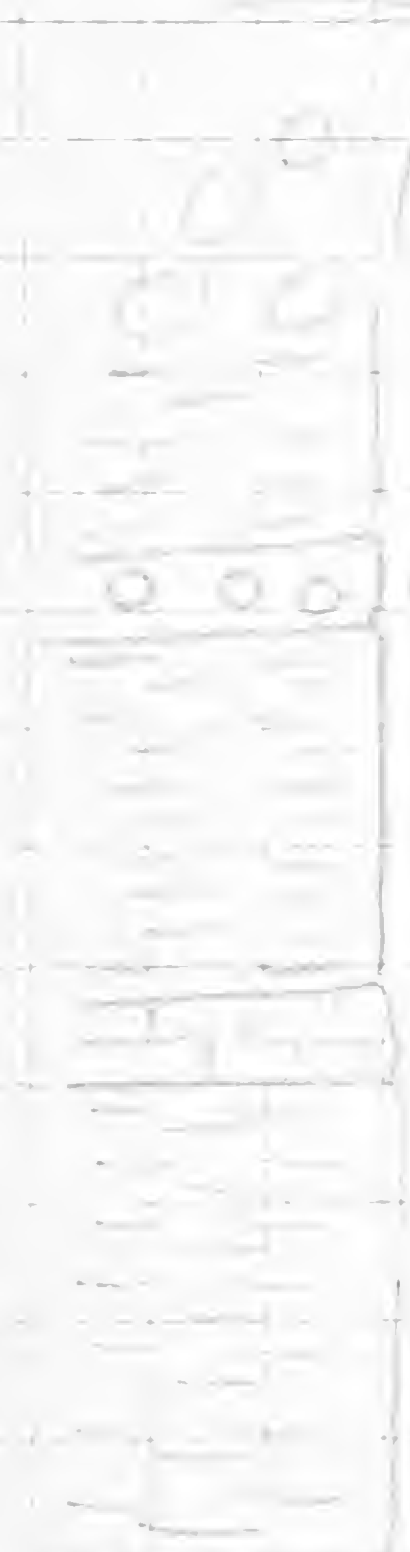
About 6'3" above the ls (C) comes a band of corals with Heliophyllums, Cystiphyllum and small Favosites

At 20'8" above the lower band of ls. comes a concretionary band of ls. that is here quite discontinuous. In the 20' interval small cup corals are prominent. In the upper 4'11" of shale pyrite concretions occur

 452

It seems a rule that pyrite concretions are most abundant in the upper 10' feet (about) or so of Moscow. The discrepancy between this section and that 700 paces to the north is probably due to cover.

Section 675 paces south of road [illegible]



At this place the corals are large and abundant, often being found as large concretions. Other fossils noted on the coral bed were S. [illegible], C. [illegible], Fenestellid.

10-15'

[illegible]

At 450 paces ~~[illegible]~~ south of road ~~[illegible]~~ in section on page 1 of July 28th's notes, the coral bed occurs [illegible] 24' 2" above the top of the 6" calcareous bed with C. [illegible]. The concretionary [illegible] here below the corals is not prominent as it is exposed only in a joint face.

The coral bed and limestone below are well exposed at Fall Brook.

453

Section 225 paces north of road

Between 3rd & 4th step [illegible] found small coral & [illegible]. Just below the 6th step the coal bed was met and it is about 2½' thick. [illegible] large [illegible] and [illegible] with coral also [illegible] P. spinosa, bryozoa, & spiriferoids.

Quadrant shows probable position of the band at the [illegible] cannot be seen.

The ls. bands cannot be distinguished here as they are too disintegrated. They are probably not good horizon markers. 2 small thin pyrite layers (½" thick) were found here.

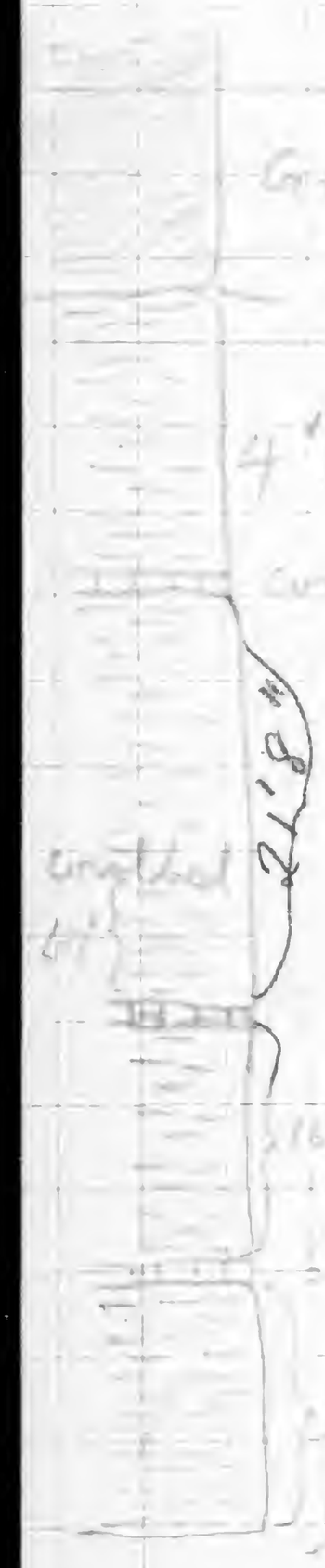
About 24' up occurs a band [illegible] sand

At 450 paces in the debris — Pleurotomarid [illegible] found. These ones and the others [illegible] do not look like the Ludlowville Pleurotomarians.
The beds above at the three-intersection (upper) with Chaetetes, [illegible] etc. belong to beds considerably lower than the Coral horizon.

454

July 28th

Little Bear Creek



July 27.

Just outside (west) of pavilion the contact of the Genesee & Moscow occurs about on the 980' contour. Here occurs a course of concretions about 20" below the contact. A reticularis occurs below the concretions, & cyclas, S. punctus above, but the shales above the concretions are not very fossiliferous.

454 bc

Sawens

Darien Sta

Ray

Bowen

A3

A2

Losee School

Murder

Centerfield

Darien

Griswold

Alexander

July 26

Plumb Lick

Boundary

WESTERN

R

ND

941

917

923

945

918

927

938

946

940

978

1030

992

1050

1041

1000

1100

1200

989

1071

1150

1103

1040

1027

1036

1058

1153

1062

1127

455

1927 455

July 21

Marden Creek

456

+ other ostracoda
The shale is dark blue grey on the surface but dark grey with a faint suggestion of brown, in section. On a sectioned surface these gave a ready effervescence with acid.
On top of this shale comes a band of ls about 1 or 4" thick. Below the ls. fossils are most numerous but of the same kind. Here L. lepida is not so common, & C. setigerus + C. lepidus, S. truncata ?, Ostracoda and tentaculites, also M. ...

This hard 4" band of limestone forms a bench across the stream. The fauna of this band is not very prolific but the following were observed
P. laevis — a small Chonetes
N. triquetra — Portion of a Euryptid
Also annelid ? Fish

The shales on this ls are like those below lithologically and faunally. Fossils noted were,
Ostracoda, — P. fragilis
C. setigerus — S. pennata
C. lepidus — S. fissurella
Leiorhynchus and shell fragments of T. — Ambocoelia (?sp).

In a concretion the same fossils were noted and in addition S. truncata, P. spinulicosta
Schuchertella cf pervesa.

The Phacops bed is a puzzler now. If this is it here (and it must be) it is not the equivalent of the Centerfield ls but is about 30' above it.
At the bridge and below the concretionary layer S. pennata becomes very abundant. Also here are found P. rana and S. pennata in many

 457

Small elongate forms that come free from the shale. B. leda was taken from a concretion.

The Pleurodictyum ^bed with^ ~~bed~~ crosses the stream 336 paces downstream from the first bridge. 60 paces upstream the concretionary bed before noted crosses the stream. Fossils noted in the shale and concretions are - P. rana c

I. carinatus r	S. mucronatus v.r.
A. umbonata (coarse) cc	Orthoceras sp. r
L. truncata c	Pleurotomaria lightly sculptured
B. leda r	P. spinulicosta c
Loxonema hamiltoniae r	S. granulatus c
C. boothi r	Palaeoneilo emarginata vr
N. cf. bellistriata r	S. fragilis c

The assemblage suggests an equivalent to the Stropheodonta bed. The concretions here are rounded or elongate masses flattened vertically. Some of them are fully 10' long. In them fossils are abundant, particularly A. umbonata and Stropheodonta.

On the next six ft of shale the following fossils were seen:-
A. spinifera
S. angulata
P. stylopora

In the lowest 2 ft of shale P. stylopora was found with S. granulosus, S. mucronatus, Streptelasma, etc. 4" above the Pleurodictyums occurs here a coral reef of Heliophyllums, Trachyporas, clumpy Favosites (argus) and a [illegible] whose affinity is more in [illegible] (cannot think of genus) [illegible]
P. stylopora

458

In the shales above the reef A. spiriferoides, S. pennatus, R. penelope are seen. Pleurotomaria and I. cornuta were found in the reef.

In the shales above the reef at 179 paces were found S. granulosus.
S. concava
A. spiriferoides
R. fimbriata
Bryozoa
R. penelope
S. pennatus
S. mucronatus

In the foot or so of shale below the Ls. the following fauna was recognized at 200 paces upstream
P. iowensis rc
~~Streptelasma~~ coral c   P. punctulifera
S. pennatus c
A. spiriferoides c
R. penelope rc
S. [illegible]
Bryozoa, many cup-shaped ones, [illegible]
C. boothi
P. rara
Ceratopora
A. [illegible]

This shale is lithologically like that below Ls. upstream, with the shale below the Ls. at the second dam at [illegible].

The 4th band of Ls. is slightly nodular, not shaly, as it is [illegible] where weathered. This stone has the following fauna:—
A. [illegible] r   P. rara rc
C. boothi rc   S. pennatus c
B. [illegible] c   M. [illegible] r
P. [illegible] rc   S. fissurella rc
M. subulata rc   Schuchertella sp.

 459

M. oblongata N. [illegible]
A. umbonata Palaeoneilo concentrica
This bag the largest no of Pelecypods so far noted, except for the layer in [illegible] Creek. which is the same

Following the ls are 10" of soft grey shale with
S. pennata cc. Syringopora
P. rana C. [illegible]
C. Cribis C. [illegible]
P. thinostriata R. punctilifera
A. umbonata [illegible]
Shells of Tentaculites
Following this shale are 3" more of ls with
L. [illegible] C. [illegible] ?
S. [illegible] N. oblongata
M. subalata cc P. rana
B. leda (very common) C. bellistriata
S. pennata Orthoceras sp
Palaeoneilo concentrica
C. [illegible]
This is probably the M. subalata bed of Grabau.

Each of these 3 beds of ls. crumbles readily under the hammer but they are resistant enough to form ledges in the stream. At 290 paces up the the 4" layer recurs.
At 375 paces soft shale with
S. pennata C. [illegible]
C. Deflexus
C. [illegible]

Between 375 + 535 paces there are no exposures but at 535 paces a small exposure of soft shale
[illegible]

460

At 870' there is a 5'6" section with only blue-gray shales for 5'. The last foot is weathered to olive shale. At 4' vertically & stratigraphically, O. spiniferus [illegible] Schuchertella & S. pennata were observed. In the weathered blue shale fossils are abundant. This horizon is not far below the Tichenor. These are

Stictopora sp.	[illegible]
R. cyclas	P. [illegible]
R. [illegible]	[illegible]
Spirifer tullius	Cystiphyllum [illegible]
S. [illegible]	R. [illegible]
Schuchertella arctostriata	F. flabellum
S. [illegible]	[illegible]
S. truncata ?	[illegible] ?

No rock is exposed from 870'-900' where the Tichenor is met.

Tichenor ls.

The first layer is about 6" thick of [illegible] crinoidal ls with many corals, both cup and [illegible]. Favosites [illegible] 1½' across. [illegible] The lower [illegible] of calc[illegible]
A. spiriferoides
[illegible] Bryozoa
Favosites [illegible]
[illegible]

[illegible]

 462

Next comes a soft bluish grey shale thick [illegible] [illegible] abound, also bryozoa. Here [illegible] found 4, [illegible]
Fav. bon.
Large crinoid stems.
Spirifers - [illegible]?

This is all not a clean shale as it contains bits of crinoidal ls with bryozoa in them in abundance. The top 5" is crinoidal ls. On this is a 15" bed of gray crinoidal limestone that is very hard. Then 4" of light grey limestone, then 2-5" shaly ls. surmounted by 7-8" of light grey ls. but it is not like crinoidal. The total thickness is about 5'1". Probably the top bed belongs to Ham.
Fossils in the top bed are:—
P. nana
Mytilarca oviformis
Camarotoechia sp
S. lineatum
S. granulatus
Cup coral

The total thickness was checked by hand level and was just under 50 ft. The Ischua was split up by intervening shale members, with Wit. Field on 120 paces from highway intersection.

 463

Fossils observed in loose Dolomite blocks.

[illegible]
V. pustulosa
[illegible]
S. sculptilis
C. impressa
[illegible]
Proetus sp (new?)
R. fimbriata
Platyceras sp.
[illegible] – in shaley material

Obe

464

July 22
Murder Crk

At 241 paces above the highway bridge at [illegible] are blue-grey shales soft and crumbly in the creek bed. These contain large calcareous concretions. The following fossils were discovered
C. [illegible]
S. [illegible]
[illegible] sp.
N. [illegible]
[illegible] sp.
T. [illegible]
At 268 paces Pleurodictyum with very large cups.

At 320 paces a band of concretionary limestone crosses the stream. This contains
I. carinatus
S. [illegible]
R. [illegible]
S. perversa ?
C. [illegible]striata
Lingula sp.
C. [illegible]
This stone is only about 3" thick. This stone is hard and forms a ledge in the stream. It has a very irregular fracture under the hammer.

This is succeeded by a soft grey shale containing
C. coronatus ?
Lingula sp.
T. carinatus
[illegible]
This shale continues to 500 paces where it is almost [illegible] and it is so soft and wet. The exposure is only about 2 ft vertical. The stone breaks into large [illegible] of irregular [illegible] [illegible]

465

466

[illegible] feet are occupied by blue grey shale, then a thin line of concretions. Then a layer of [illegible] [illegible] concretions in [illegible] about one ft. [illegible] this was 1½' shale. On top is about 2' shale.

Soil
Shale 2'
[illegible] [illegible] concretionary 1'
shale 1½'
[illegible] concretions

1½ — stream — [illegible] [illegible] [illegible] [illegible] [illegible]
C. [illegible]
[illegible] sp.
[illegible]
[illegible]

About 15 paces up stream from the [illegible] old highway [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] a little higher (about 1' vertically) are to be found about 1' ? (covered about 50 paces in creek) is a hard band of concretionary [illegible]. This has the following fossils:—
[illegible]
[illegible] [illegible]
C. [illegible]
[illegible]
C. reticularis (small + with thin ribs
C. [illegible]
R. [illegible]
[illegible]
R. [illegible]
Some of the [illegible] [illegible] this band [illegible] are almost completely [illegible] of C. reticularis

 467

In the shale below the b. the following fossils were observed
Schuchertella pervers[illegible] (large)
C. Boyntoni
[illegible]
A large Stropheodonta
[illegible]
[illegible]
[illegible]
[illegible]
R. [illegible]
R. [illegible]

About 200 yds north of the railroad crossing in the stream bed about 100 yds north of the dam the contact of the Mississippi & Genesee is 4' above stream level. The contact must cross the stream just above the dam, at about the railroad crossing. A thin layer of limonite here showed the former presence of a pyrite lens.

Above the conch[illegible] bed are 6-7' of soft shales, with a sparse fauna. Fossils noted were;
C. [illegible]
C. [illegible]
C. [illegible] c
[illegible]
[illegible] sp.
[illegible] — noted in other sections of Mississippi also.
A small cup coral.

468

The layer of C. is about 1' thick and very nodular due to small concretions in the lower layers which are about 1" in dia. [illegible] of the [illegible] [illegible] Many of these [illegible] contain [illegible] concretions [illegible] pyrite [illegible] [illegible] in the shale below the C.

Part of Genesee was found here.

469 1928

469

July 25
Lancaster

470

471

472

473

311c

BATAVIA

A

S T A F F O R D

E T H A N Y

P A V I L I O N

Stafford

Canada

Roanoke

East Bethany

Bethany

Linden

Pavilion

Pavilion Center

B.M.

1

2 Bar

3

Bar

4

Bar

VALLEY R. R.

ERIE R. R.

(ATTICA BR.)

LEHIGH

NEW YORK CENTRAL R. R

(BATAVIA AND CANANDAIGUA BR.)

LACKAWANNA AND WESTERN R. R.

DELAWARE

Creek

Black Creek

Oatka Creek

Mill Creek

ROCHESTER DIV.

COUNTY FARM

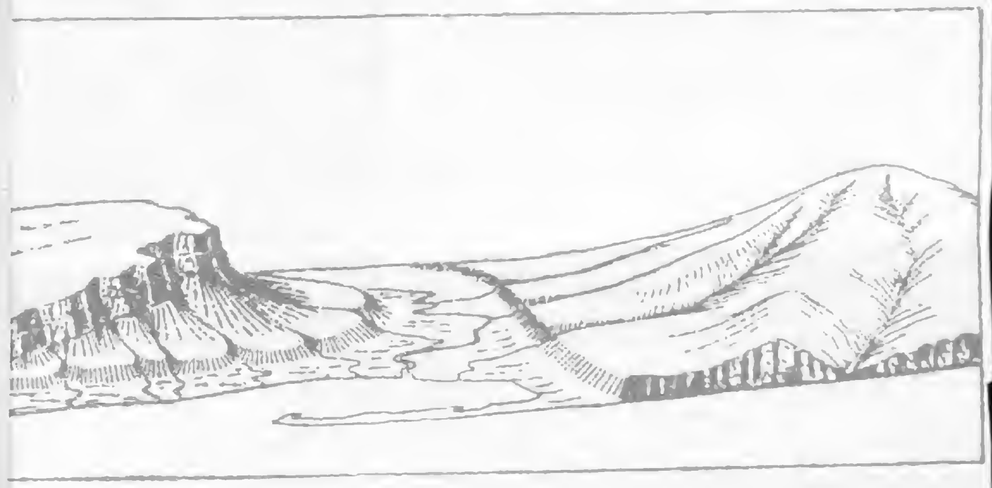
BOUNDARY LINE

...TO MAPS OF THE UNITE...

The conventional signs used to represent these
own and explained below. Variations appear on
maps, and additional features are represented on
naps.

ter features are represented in blue, the smaller
anals by single blue lines and the larger streams,
the sea by blue water lining or blue tint. Inter-
ns—those whose beds are dry for a large part of
shown by lines of blue dots and dashes.

nown by contour lines in brown, which on some
plemented by shading showing the effect of light
the northwest across the area represented, for the
iving the appearance of relief and thus aiding in
ation of the contour lines. A contour line repre-
ginary line on the ground (a contour) every part
t the same altitude above sea level. Such a line
wn at any altitude, but in practice only the con-
ain regular intervals of altitude are shown. The
acoast itself is a contour, the datum or zero of alti-
ean sea level. The 20-foot contour would be the
the sea should rise 20 feet. Contour lines show
the hills, mountains, and valleys, as well as their
uccessive contour lines that are far apart on the
e a gentle slope; lines that are close together indi-
slope; and lines that run together indicate a cliff.
ner in which contour lines express altitude, form,
shown in the figure below.



of ... New Mexico, are ...
cy to be used in the publication of maps on a scale of
inch = nearly 2 miles), with a contour interval of 25 to
et.

opographic survey of Alaska has been in progress since
... nearly 37 per cent of its area has now been mapped.

4034

HIC MAP OF THE UNITED STATES

full lines, but by lines of which are dry during a own by oblique parallel are shown by horizontal tufts of blue, and fresh- mps by blue tufts with

contour lines in *brown*. ough points which have who follows a contour on ither uphill nor downhill.

use of contours not only ins, hills, and mountains utions. The line of the r line, the datum or zero sea level. The contour sea level is the line that the sea were to rise or the Such a line runs back up around the points of hills along this contour line is ast line, while on a steep a succession of these con- The map indicates a gentle a steep slope; and if the one line, as if each were above it, they indicate a the country are depressions s. The contours of course ney surround hills. Those sinks are usually indicated ases, on the inside of the erval, or the vertical dis- contour and the next, in ecial map. This interval he character of the area

their descriptions, as well as the descriptions and geodetic coordinates of triangulation stations, are published in the annual reports and bulletins of the Survey. The publications pertaining to specified localities may be had on application.

The works of man are shown in *black*, in which color all lettering also is printed. Boundaries, such as State, county, city, land-grant, reservation, etc., are shown by broken lines of different kinds and weights. Cities are indicated by black blocks, representing the built-up portions, and country houses by small black squares. Roads are shown by fine double lines (full for the better roads, dotted for the inferior ones), trails by single dotted lines, and railroads by full black lines with cross lines. Other cultural features are represented by conventions which are easily understood.

The sheets composing the topographic atlas are designated by the name of a principal town or of some prominent natural feature within the district, and the names of adjoining published sheets are printed on the margins. The sheets are sold at five cents each when fewer than 100 copies are purchased, but when they are ordered in lots of 100 or more copies, whether of the same sheet or of different sheets, the price is three cents each.

The topographic map is the base on which the facts of geology and the mineral resources of a quadrangle are represented. The topographic and geologic maps of a quadrangle are finally bound together, accompanied by a description of the district, to form a folio of the Geologic Atlas of the United States. The folios are sold at twenty-five cents each, except such as are unusually comprehensive, which are priced accordingly.

Applications for the separate topographic maps or for folios of the Geologic Atlas should

42°45'

LAKE ERIE

Walden Cliffs

Lakeshore Beach

Walden Cliffs

Clover Bank

Wanakah

Weyer

Walden Cliffs

Idlewood Sta.

Lakeview

Idlewood Creek

Eighteenmile Creek

North Evans

Pike Creek

Derby

Little Sister Creek

Rythus Creek

Eden

Pontiac

SOUTHERN MICHIGAN AND N.Y. R.R.

CHAUTAUQUA AND ST. L. R.R. DIV.

LAKE SHORE AND PENNSYLVANIA R.R.

BUFFALO AND JAMESTOWN R.R.

H A M

F E D

B.M.

40°

403e

LAKE ERIE

573

West Seneca

WEST SENECA

Creek

Reserve

Smoke

Creek

1

CHICAGO AND ST LOUIS SOUTHERN R R

South

Roland

PITTSBURGH R R

ELECTRIC

Branch

700

11

Woodlawn Beach

Blasdell

Windom

2

600

700

600

HAMBURG

BUFFALO

DIV

Rush

ERIE R R

Bay View

Big Tree

Steelton

BUFFALO AND JAMESTOWN DIV

East Hamburg

3

Athol Springs

Hamburg Park

Orchard Park

4

PENNSYLVANIA DIV

Hamburg Sta.

Abbott Road

5

Clover Bank

663

Rush Creek

Avery Creek

6

LAKE ERIE

573

Wanakah

FAIRGROUNDS

Armor

7

EAST

Weyer

Creek

8

Walden Cliffs

HAMBURG

Newman

9

BM

HAMBURG

10

Idlewood Sta

Lakeview

Creek

Eighteenmile

Water Valley

Pike Creek

MICHIGAN S&L CHAUTAUQUA DIV

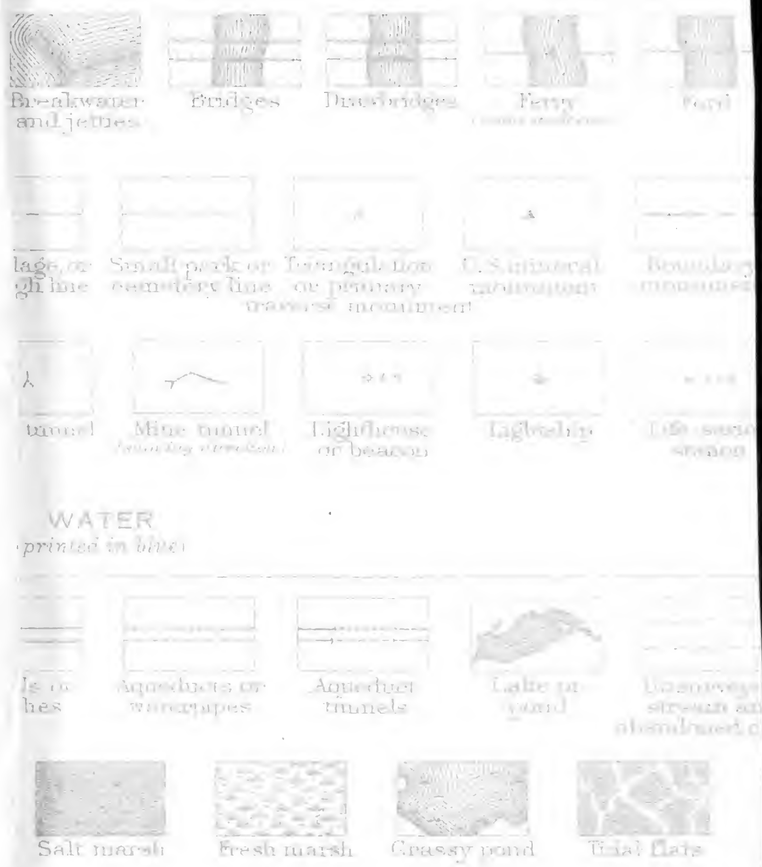
BUFFALO AND

Eighteenmile

North Evans

BM

AND



he United States Geological Survey is making a stan
graphic atlas of the United States. This work has bee
ress since 1882, and its results consist of published ma
e than 40 per cent of the country, exclusive of outl
essions.

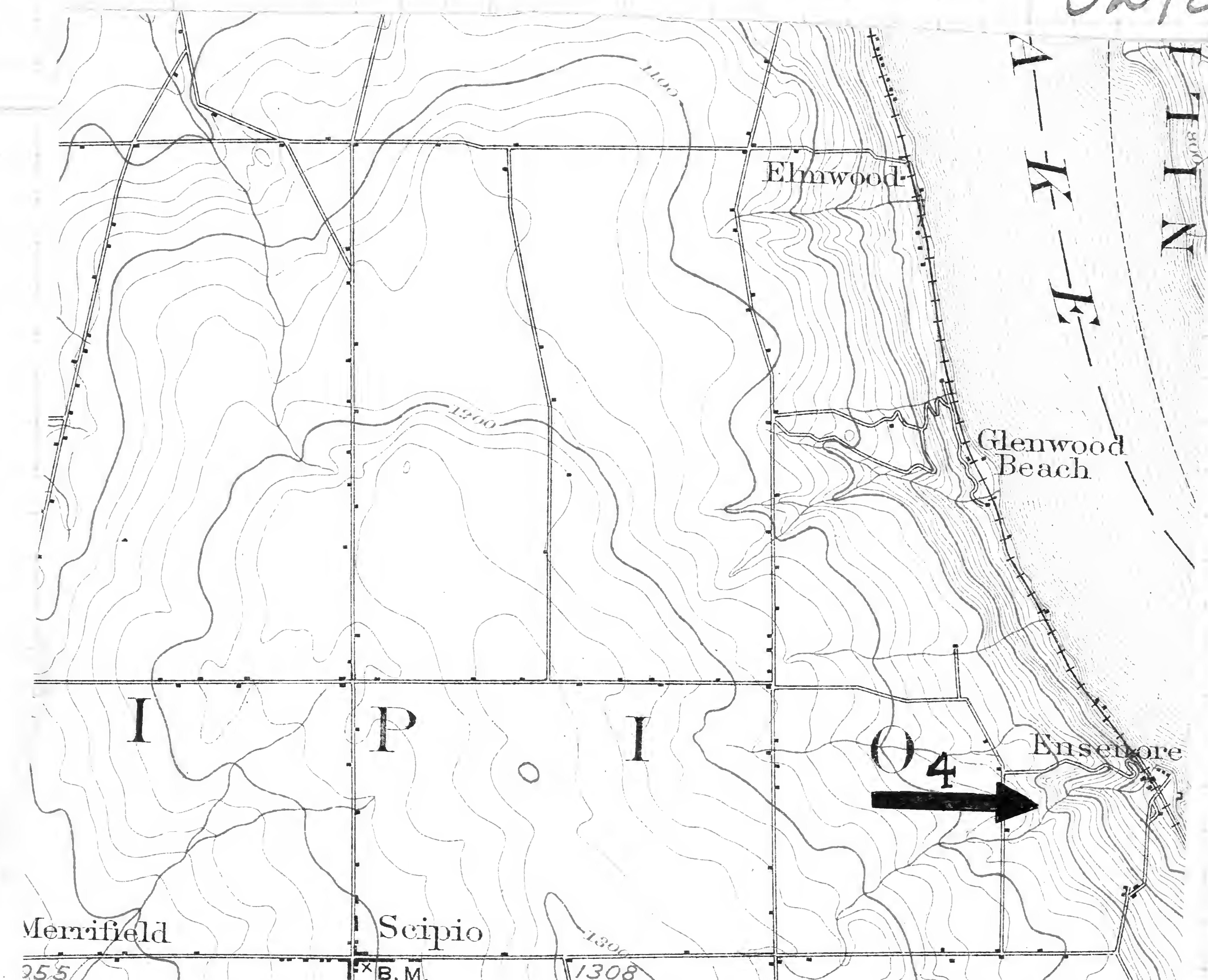
his topographic atlas is published in the form of ma
sheets measuring about 16½ by 20 inches. Under the
ral plan adopted the country is divided into quadrangles
ded by parallels of latitude and meridians of longitude.
e quadrangles are mapped on different scales, the scale
ted for any quadrangle depending on its nature and its
ble future development, and consequently though the

represents an imaginary line on the ground above, part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in mapping only the contours at certain regular intervals of altitude are shown. The line of the seacoast itself is a contour, the datum or zero of altitude being mean sea level. The 20-foot contour, for

gradually away and forms an inclined table-land that
versed by a few shallow gullies. On the map each of
features is represented, directly beneath its position i
sketch, by contour lines.

The contour interval, or the vertical distance in feet be
one contour and the next, is stated at the bottom of each
This interval differs according to the topography of the
mapped; in a flat country it may be as small as 1 foot
mountainous region it may be as great as 250 feet. C
contour lines, every fourth or fifth one, are made heavier
the others and are accompanied by figures showing alt
The heights of many points—such as road corners, sur
surfaces of lakes, and bench marks—are also given on th

329a



Elmwood
Glenwood
Beach
Ensenore
I P I O
O4
Merrifield
Scipio
B.M.
1204
1308
1304
1349
1200
1100
Salmon
Cr.
s Corners
N I C E

August 17.

Eisemore Ravine

81 paces from the railroad tracks on the point and directly behind the old Eisemore Glen house is a falls and an exposure of shales in the bottom of the Glen. The [illegible] calcareous and soft. It is dark blue grey and has many fossils:—

R. fimbriata
A. concentrica
Lox. hamiltoniae
P. rana
L. densa ✓
U. triquetra
C. inflata ✓
C. mucronatus
A. umbonata ✓
M. pygmaea ✓
B. crenistria
M. subalata ✓
M. concentrica ✓
P. flabellum ✓
Cypt. hamiltonensis ✓
P. comatus
N. arguta ? ✓
S. chemungensis ✓

M. spinigerus
✓ C. bellistriata
C. reticularis
S. pennatus
S. acutostriatus
C. boothi
Paracyclas lirata
✓ A. decussata
Aulopora sp.
P. [illegible] ?
Platyceras sp.
[illegible]
Cup coral.
✓ S. granulosus
✓ S. audaculus
C. [illegible]
✓ Par hamiltoniae
[illegible]

The fossils occur usually in layers of irregular extent, sometimes quite calcareous from crinoid remains. This is the first occurrence of P. flabellum I have noted so far down in the section. The falls comes at about 105 paces.

In the next 5' of rock collecting is not so easy. The shales are a dark

331
blue grey and rather massive giving
no effervescence with acid. The following
forms were observed:-
S. perplana   D. subemarginata
C. mucronatus c
C. coronatus
Pal. concentrica
Prod. cf spinulicosta
P. nana
D. arcuata

Between 10'10" & 15'15" the shales are rather
hard, medium blue grey and calcareous.
They are like those seen on Bloomer Ck.
Indeed large blocks in the stream filled
with Trilobites are exactly like those on
Bloomer.
15'15" - 20'20" — a loose piece here contained
D. sculptilis   R. cyclas
T. carinatus   C. mucronatus
S. inaequistriata   Cran. hamiltoniae
a fenestellid
Other fossils at this level are:-
Pal. plana
The brink of the falls is at about 30' above
the 81st. pace. At about 35' up a slab
was found that contained ^piece^ I. carinatus
in great abundance, Cran. hamiltoniae,
D. sculptilis, S. inaequistriata, Platyceras sp,
N. bellistriatus, S. arctostriatus, S. perplana,
C. setigerus, Par. hamiltoniae, Rhipidomella sp,
M. concentrica,
This was essentially a calcareous layer
and as far as I can see is identical
to similar layers, which are green
because the matrix is sandier, at
Fertile Stock Farm.
The rock in the face of the falls from
25' - 27' is a hard calcareous shale
like most of that at Bloomer. At 27'

332

a rather large crop could was discovered
about 3 to 5 paces above the brink of the
falls the following were noted:

V. B. fimbriata
P. flavus
Pol. convolutus
E. itys
Grammia sp (small)

From the brink of the falls to 229
paces above the angle a little shale was
traversed which was slightly more readily
worn down & degraded by weathering.
Fossils not so plentiful in these
rocks as below. The species
recorded above are M. obliqua, S. granulosa
L. delia, P. atyloporus.

At 229 paces is the commencement of shales a foot below which many small concretions, fossils here are:

V. carinata c ✓
M. concinna c ✓
Par. hamiltoniae rr ✓
P. rugosa rr
V. elongata rr ✓
Pol. convolutus rr ✓
C. complanata rr ✓
Cam. hamiltoniae rr
C. inaequistriata (?) ✓
R. vanuxemi rr ✓
Tentaculites
N. varicosa r ✓
Cyclonema sp. rr
O. bellistriata r ✓
R. aculeata r ✓
R. fimbriata rr ✓
M. bellistriata r ✓
M. concentrica rc
Lox hamiltoniae r
Orientoporites sp r
A. spiriferus rr ✓
A. clavicosta rc

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M. concinna c ✓
Par. hamiltoniae rr ✓
P. rugosa rr
V. elongata rr ✓
Pol. convolutus rr ✓
C. complanata rr ✓
Cam. hamiltoniae rr
C. inaequistriata (?) ✓
R. vanuxemi rr ✓
Tentaculites
N. varicosa r ✓
Cyclonema sp. rr
O. bellistriata r ✓
R. aculeata r ✓
R. fimbriata rr ✓
M. bellistriata r ✓
M. concentrica rc
Lox hamiltoniae r
Orientoporites sp r
A. spiriferus rr ✓
A. clavicosta rc

V. carinata c
M. concinna c
Par. hamiltoniae rr
P. rugosa rr
V. elongata rr
Pol. convolutus rr
C. complanata rr
Cam. hamiltoniae rr
C. inaequistriata r
R. vanuxemi rr
Tentaculites
N. varicosa r
Cyclonema sp. rr
O. bellistriata r
R. aculeata r
R. fimbriata rr
M. bellistriata r
M. concentrica rc
Lox hamiltoniae r
Orientoporites sp r
A. spiriferus rr
A. clavicosta rc

S. granulosa c
L. delia c
P. atyloporus c
Leptodesma rr
Ambocoelia rr
Schizodus rr
Nuculites rr
Nuculites ? rr
Modiomorpha rr
Goniophora rr
Cypricardella rr
Cypricardinia rr
Grammysia rr
Edmondia rr
Edmondia ? rr
Pleurotomaria rr
Platyceras rr
Platyceras ? rr
Bellerophon rr
Bellerophon ? rr
Orthoceras rr
Tornoceras rr
Tornoceras ? rr
Agoniatites rr
Agoniatites ? rr
Crotalocrinus rr
Crotalocrinus ? rr
Cyathocrinus rr
Cyathocrinus ? rr
Glyptocrinus rr
Glyptocrinus ? rr
Dolatocrinus rr
Dolatocrinus ? rr
Ctenocrinus rr
Ctenocrinus ? rr
Eucalyptocrinus rr
Eucalyptocrinus ? rr
Pisocrinus rr
Pisocrinus ? rr
Hexacrinus rr
Hexacrinus ? rr
Homocrinus rr
Homocrinus ? rr
Taxocrinus rr
Taxocrinus ? rr
Actinocrinus rr
Actinocrinus ? rr
Dendrocrinus rr
Dendrocrinus ? rr
Megistocrinus rr
Megistocrinus ? rr
Melocrinus rr
Melocrinus ? rr
Rhodocrinus rr
Rhodocrinus ? rr
Scaphiocrinus rr
Scaphiocrinus ? rr
Stephanocrinus rr
Stephanocrinus ? rr
Zaphrentis rr
Zaphrentis ? rr
Cyathophyllum rr
Cyathophyllum ? rr
Acervularia rr
Acervularia ? rr
Favosites rr
Favosites ? rr
Alveolites rr
Alveolites ? rr
Michelinia rr
Michelinia ? rr
Fenestella rr
Fenestella ? rr
Polypora rr
Polypora ? rr
Ptilopora rr
Ptilopora ? rr
Rhombopora rr
Rhombopora ? rr
Stictopora rr
Stictopora ? rr
Trematopora rr
Trematopora ? rr
Cystodictya rr
Cystodictya ? rr
Hederella rr
Hederella ? rr
Spirifera rr
Spirifera ? rr
Cyrtina rr
Cyrtina ? rr
Reticularia rr
Reticularia ? rr
Chonetes rr
Chonetes ? rr
Productella rr
Productella ? rr
Productus rr
Productus ? rr
Strophalosia rr
Strophalosia ? rr
Orthis rr
Orthis ? rr
Rhynchonella rr
Rhynchonella ? rr
Camarotoechia rr
Camarotoechia ? rr
Pentamerella rr
Pentamerella ? rr
Meristella rr
Meristella ? rr
Atrypa rr
Atrypa ? rr
Retzia rr
Retzia ? rr
Athyris rr
Athyris ? rr
Nucleospira rr
Nucleospira ? rr
Lingula rr
Lingula ? rr
Discina rr
Discina ? rr
Orbiculoidea rr
Orbiculoidea ? rr
Crania rr
Crania ? rr

The horizon with V. pustulosa is about 23-25' above 1st Falls.

333

This horizon is approximately 21' above the brink of the falls.

At 250 paces comes a calcareous lens abounding in S. granulosus. Other fossils are:-

M. concentrica
✓C. scitulus
M. mytiloides
✓D. sculptilis rc.
Gon. hamiltonensis
✓N. concinna
✓A. spiniferoides
P. patulus
✓T. carinatus
Cyclonema sp
✓S. audaculus
A. decussata

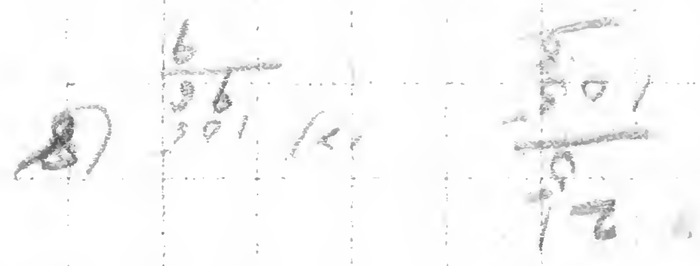
At 278 paces another zone is like that above bearing S. granulosus, S. audaculus, M. mytiloides r, V. pustulosa S. perplana, O. carinatus, R. vanuxemi, M. concentrica, A. spiniferoides, N. concinna P. oviformis, C. coronatus, D. truncata, P. stylopora, P. rana, A. decussata, D. sculptilis, R. vanuxemi — contains considerable pyrite On top of the shales at 278 come the black shales with L. lama.

Other fossils at 278 are G. obsoleta, N. oblongata, Sclumbertella, N. varicosa, Orbiculoidea, A. spiniferoides c,

At 569 paces the hand-level is used on a high falls. Fossils noted in these shales are:- Aulopora sp., M. subalata, S. pennatus, L. lama, P. rana, C. boothi, N. triquetra, N. corbuliformis, C. bellistriata, L. laevis, T. subulatum

Fauna 21'8" above 569 pace:-

C. bellistriata c
P. discordanum
N. corbuliformis
M. subalata c
A. umbonata
Lox. hamiltoniae
N. lirata
Orthoceras sp.
A. spiniferoides



32' up were found P. spinulicosta, L. laura, C. bellistriata, P. discoidenum and Orthoceras sp. At about 48' up + in dark blue-grey shales the following were found:-

S. rectum, Pal. concentrica, O. parvula,

Between 48 + 54' the following were seen:- M. subulata, L. laura, S. plumatus, S. ruintum, Cyclonema sp.,

Between the 10th + 11th steps (54-60' up. The following were seen:- M. subulata, large, S. pennatus (very long winged), N. triquetra, N. oblongatus, Orthoceras.

At 59'9" Pal. concentrica, S. plumatus, S. subulatum, S. pennatus, C. elongata, A. spiriferoides, N. oblongatus, S. ruintum, B. Leda, P. fragilis, P. radiata, A. umbonata, T. subemarginata, S. concava.

Fauna between 18-19 steps:- 100'

A. spiriferoides
Pal. tenuistriata — Pal. concentrica
S. pennatus — N. oblongatus
C. setigerus — M. pygmaea

The shales here appear more massive and have so since the 11th step. Shales like this & with a similar Fauna are present in Pattersons Glen on the Morrisville quad.

The top of this mud falls is at 116' and here a hard layer of coarse shale, non-calcareous forms the falls. Fossils are not abundant here either. Those noted are:- C. scitulus, abundant, C. bellistriata, S. pennatus, A. spiriferoides, A. decussata, S. fasciolaria, Goniophora sp. C. setigerus, P. rana.

The coarse, hard shale continues about 3' above the falls when a softer stone is encountered.

$$\frac{23}{5}$$

$$\overline{)115}$$

$$\frac{9}{124}$$

$$\frac{130}{10}$$

 335

At 126' above the 569 pace in the cascade above the 2nd falls was noted a thin ss. band. Above this the shales become somewhat more fossiliferous. Below it they are rather hard, tho softer than those at the brink of the 2nd. falls Found below these thin ss (1") were S. pennatus + N. triquetra & N. oblongatus.

Above these ss at 130' above the 569th pace came many C. scitulus, T. submarginata M. concentrica. S. pennatus. At 141' 10" is a hard band about 10" thick that forms the 3rd falls or cascade above the 2nd Falls. This band is hard and is calcareous in places. A concretionary mass in it contained S. pennatus in abundance and C. scitulus in abundance T. carinatus, a terebratulid, A. decussata, P. tenuis ?, M. concentrica.

In the shales below C. scitulus was common, broad-winged S. pennatus, + O. carinata.

Above this hard band at 141' up above 569 the shales are much finer but the 10" of rock just on the hard band is calcareous + very fossiliferous. It contains A. spinifera(?), S. rectum, C. boothi S. macronotus, S. audaculus, S. consors(?), C. scitulus, P. flabellum(?), C. coronatus, A. decussata, N. oblongatus Pal. concentrica R. vanuxemi, P. rana, In places this layer is a ls. made up mostly of fossils. S. perplana, A. reticularis, !

In the rock that succeeds this there are calcareous bands + lenses with many fossils. The fauna in the 5"-5" above the hard band noted at 141' above 569 pace follows:-

 336

√ C. bellistriata cc
√ Pal. ~~concentrica~~ constricta
√ S. macronotus
√ P. iowensis
√ M. concentrica
√ C. scitulus.

A. spiriferoides cc
Orbiculoidea sp
√ M. pygmaea
√ S. perplana
√ S. macronotus
√ S. audaculus

Much of the rock between 141 and 144' is calcareous.

P. rana
√ C. coronatus

√ H. oblongatus
√ S. pennatus
S. rectum

In the shales between 146'5" and 151'10"

C. bellistriata cc
Pholidops hamiltoniae cc
√ S. pennatus cc
√ H. oblongatus
√ P. radiata
S. chemungensis
√ P. tenuistriata
P. discoideum
√ M. pygmaea.

√ Pal. ~~concentrica~~ constricta
√ Ar. varicosa
√ N. triquetor
Lox. hamiltoniae
B. leda
√ P. tenuis
N. orbiculiformis

Between 157 & 173' above the 569th pace the shales have become harder under the hammer and at 173 the fauna appears to be changing. The fauna at 152 had many A. spiriferoides & S. pennatus. At 173' were noted –

√ P. flabellum c
√ M. concentrica rc
√ G. granulosus
Rhipidomella sp.
√ P. oviformis
√ Par. hamiltoniae

Orbiculoidea
√ T. carinatus
√ S. pennatus.
√ R. vanuxemi
√ C. bellistriata
A. princeps

additional fossils noted between 173 & 180' are –

P. radiata
C. scitulus

S. perplana
P. rana
Increased abundance of A. spirif.

141

$$\begin{array}{r} 13 \\ 5 \\ \hline 65 \\ 5 \\ \hline 70, \\ 141 \end{array}$$

At 184' above 569 were found S. demissa S. inaequistriata and above here the shales seem to become much softer Other fossils were A. spiniferoides, cc, C. bellistriata, ✓S. granulosus.
At about 186' (2' above the 8th step above 141 the rock is calcareous, made up mostly of fossils and forms a flat here undoubted Cam. hamiltoniae, G. arcuata,

At 10 steps above 141' the shale is calcareous. Between 12 + 13 besides T. carinatus + T. communis only a Spirifer like S. Tullius was noted This condition was seen at Skaneateles. The Tichenor comes at 211' above 569. + is a xln grey ls. on it are 5½–6' of shale + lls alternations but no attempt was made to collect these on the Tichenor.
The ls. on the Tichenor has:-

S. pennatus
T. carinatus
H. delawarensis
P. rowi
Camarotoechia sp.

338

Ensenore.

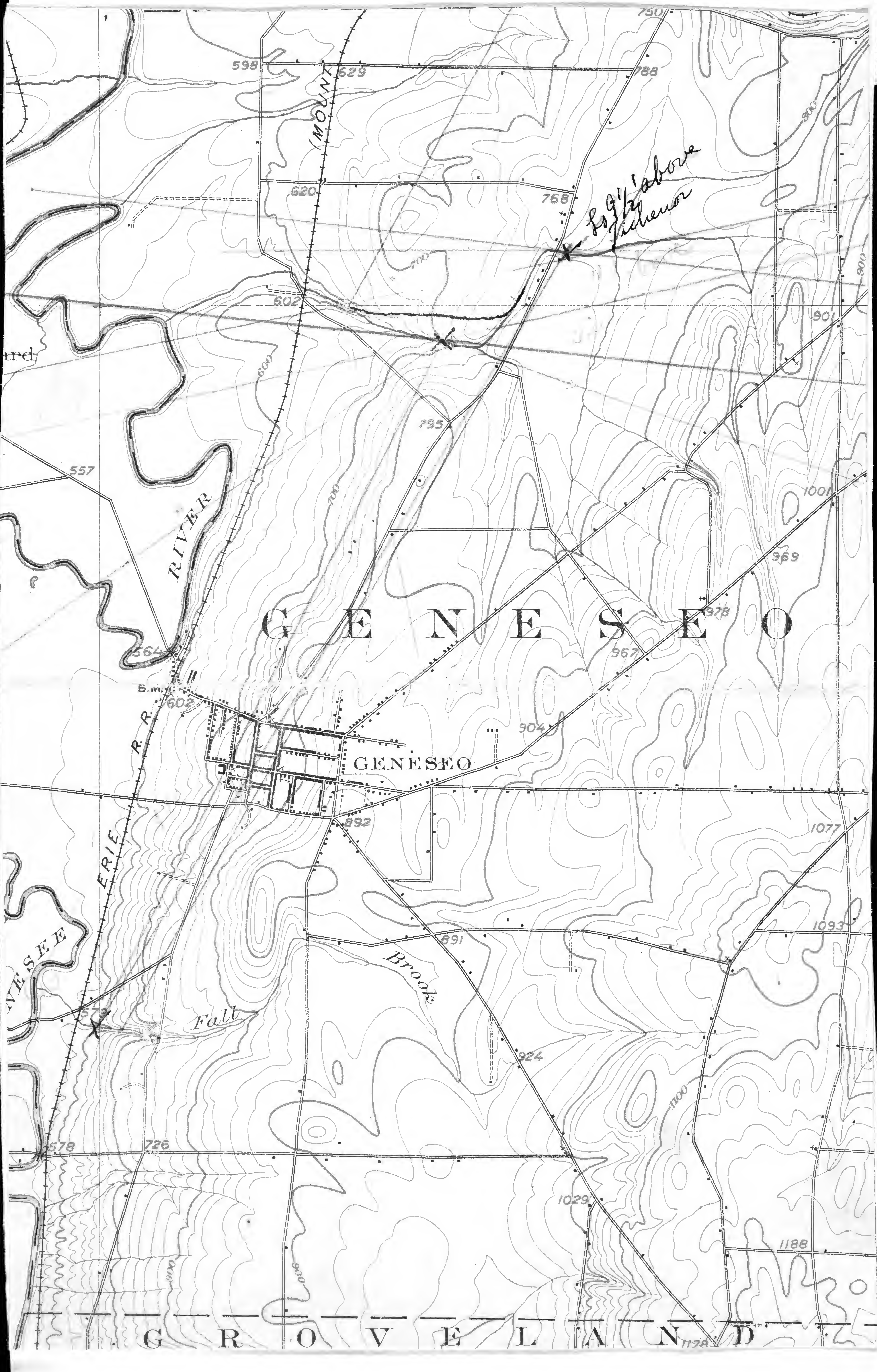
The lowest shales in Ensenore and up to the dark shales, amounting to over 50' have a prolific fauna with a few corals, also V. pustulosa at the top. [illegible] must expand to yield the interval of shales from the top of the Skaneateles to at least the top of the [illegible] horizon. A few of the Pelecypods found in the lower part of the Ludlowville just behind the old Ensenore Glen House, such as P. flabellum, P. lirata, & N. arguta are very suggestive of the Gilboa horizon.

The dark shale horizon seemed somewhat coarser and rather lighter than on the east side of Cayuga Lake. Its exact thickness I could not determine, but it must occupy most of the red falls. A. spiriferoides horizon is practically the whole of the upper part of the Ludlowville.

Clarke's Tellinopsis zone I did not recognize. The Glyptodesma? shale below the Tichenor was quite barren but had T. carinatus & a Spirifer. Also S. [illegible]. I did not recognize it. This condition was also noted at Sheldrake. The S. demissa and P. flabellum combination was also noted on Lake Erie.

When P. flabellum comes in and above there was a very noticeable falling off in the numbers and kinds of fossils.

338a


598
629
(MOUNT
750
788
900
620
768
Ls 9½' above Tichenor
700
602
901
ard
600
795
557
700
1001
RIVER
969
G E N E S E O
978
564
967
B.M.
602
R. R.
904
GENESEO
892
ERIE
1077
891
Brook
1093
NESEE
573
Fall
924
1100
578
726
1029
1188
900
900
G R O V E L A N D
1178

339

Fall Break

340

A. spinosa c — H. concinna r
A. reticularis cc — S. [illegible] r
R. [illegible] c — C. unidenta vr
[illegible] c — C. bellistriata vr
S. [illegible] — [illegible] vr
S. [illegible] r — R. cyclas vr
Pl. [illegible] sp. — A. [illegible] vr
R. [illegible] vr — Platyceras sp.
C. [illegible] — R. [illegible]
S. pinnata [illegible] — [illegible]
[illegible] — [illegible] C. [illegible].

As one [illegible] the [illegible] actually the [illegible] abundant and [illegible] at [illegible] ft [illegible] at the base of the [illegible] D. [illegible] becomes [illegible] in beautifully preserved forms. Other fossils observed at the contact with the [illegible] and about a foot below are:-

A. reticularis
Streptelasma corals
A. [illegible]
P. [illegible]
S. pinnatus

Not a single [illegible] has been seen since the [illegible] bed

Fossils observed in the 4th band are:-

Small corals. c. — R. [illegible]
S. [illegible] (without points)
P. [illegible]striata
C. unidenta
P. [illegible]
Pal. concentrica
Schuchertella sp.
Camarotoechia sp.

 342

In places the C[illegible] is [illegible] and dark grey bedding Crinoid stem segments. It may be the equivalent of the Nesteff ls. In others it [illegible] shale and [illegible] may be [illegible] with a [illegible] [illegible] and [illegible] [illegible].

The [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] that it is quite probable that the [illegible] [illegible] [illegible] a change in sedimentation and not in fauna.

Section at 710 paces

Limestone [illegible]

Pyrite [illegible] 6-7"

11' 4" Shale

4-5" concretionary ls.

19' 3"

coal layer 1'

6' 5'6"

[illegible]

A. [illegible] A. [illegible]

The shales [illegible] the [illegible] [illegible] yielded the following species:

A. reticularis
S. [illegible]
C. [illegible]
S. [illegible]
Athyris
large Sp[illegible]
[illegible]
[illegible]
[illegible]
Crinoid fragments

C. boothi
P. [illegible] (large)
[illegible] ?

343

This fauna continues up for about 2 or 3 feet when the shales become sparser in fossils until 6' above the ls (4") band comes a layer with many cr[illegible] [illegible] 1st [illegible] Brach[illegible] [illegible] and Cystiphyll[illegible]

At 760 paces [illegible] and [illegible] [illegible] of the [illegible] above the [illegible]. The bottom of the coral bed is at 5' 6" above upper ls band and is a foot thick. It has many corals -
[illegible] pruinatus
[illegible] spinosa
[illegible]

About 1' above the coral bed was found
T. carinatus
A. spiniferoides
S. granulosus
S. inaequistriata

and found

10' 10" [illegible] [illegible] C. columbaris, [illegible], Stropheodonta, R. [illegible]. Then at 19' above the 4" band comes the second conspicuous band of ls. Below this band large Spirifers are common. The contact with the Genesee is exactly 10' 10" above the second ls. band at 760 paces.

The falls is at about 890 paces.

 344

The upper concretionary layer has
A. reticularis,

Fall Brook contd

At the falls the lower 20' are Moscow but are not favorably exposed for collecting. However collecting is favorable above the upper ls. ledge on the south side of the brook than the ls itself, which is a hard grey ls. carries A. reticularis, P. nana, 2 crinoids A. spinosa

In the concretionary ± limestone occurs a layer of local [illegible] of calcareous shale, quite filled with some crinoid fragments and other fossils. Also there were found
A. reticularis
A. spinosa
A. spiriferoides
P. nana
Bryozoa
Aviculopecten

The shale for about 5' above the concretionary ls is light grey. ~~[illegible]~~ This shale contains
C. [illegible] A. reticularis
C. [illegible]
P. nana
M. subumbona
Bryozoa

Shale 4' below the pyrite contains pyrite concretions sometimes, many of these pyrite masses are pyritized shells and in this case are Loxonemas and a Pleurotomaria, there also 2 Lingulas were found and some large Spirifers

345

In the shale just below the coral bed and on the zone containing the abundance of large Spirifers occurs another with the following species:–
L. laura
Orbiculoidea
A. [illegible] (large)

The upper ls. is one that is very distinct and here can be followed with great ease.

Several distinct zones are here recognizable:–
1. There is a C. [illegible] and A. spinosa zone below the lower ls.

2. On the lower ls. lies a zone with many large Spirifers, P. [illegible], Platyceras etc. This gives way to a zone also [illegible]
3. With L. laura and Orbiculoidea and this to

4. The coral zone with Cystiphyllum, then
5. Fossils like those on the lower ls., (zone 2) are found till the upper ls. is met.

6. Fossils like zone (2)

7. Somewhat barren shales with pyritized [illegible], Lingulas and an occasional large Spirifer
8. Pyrite
9. [illegible]

Below the [illegible] zone an Ambocoelia zone [illegible] and considerably [illegible] [illegible]

346

On the stream-bed about 100 yds below the falls is a large concretion calcareous but containing a layer of pyrite 1" thick and two feet in one direction and 3 in the other at 425 ft. contains large [illegible] and [illegible]. 4 in in the [illegible] on the [illegible] side about 3' below the coal bed.

From 453-460 passes 6" of [illegible] sh. carries an abundant fauna:-

R. nana rc | A. [illegible] a
[illegible] cc | C. [illegible] r
Platyceras cc | P. [illegible] r
C. [illegible] c | A. [illegible] r
D. [illegible] c | I. [illegible] rc
E. [illegible] cc | R. [illegible] r
[illegible] rr | H. [illegible] rc
Cryptonella vr | [illegible] r
C. coronatus a | M. [illegible]? vr
A. reticularis | R. [illegible] rc
C. [illegible] | Crinoid fragment

In places the rock is a very stiff shale but the upper ledge at 460 pass into rather hard [illegible] [illegible] [illegible] it.

[illegible] Valley 1918

347

Fall Brook

183 paces from RR. bridge [illegible]
shale, stones in [illegible]
Pholadops [illegible]   Spirifer [illegible]
[illegible]   [illegible]
[illegible]

The top of the outcrop is at about 228'. The [illegible] extends from 153-200

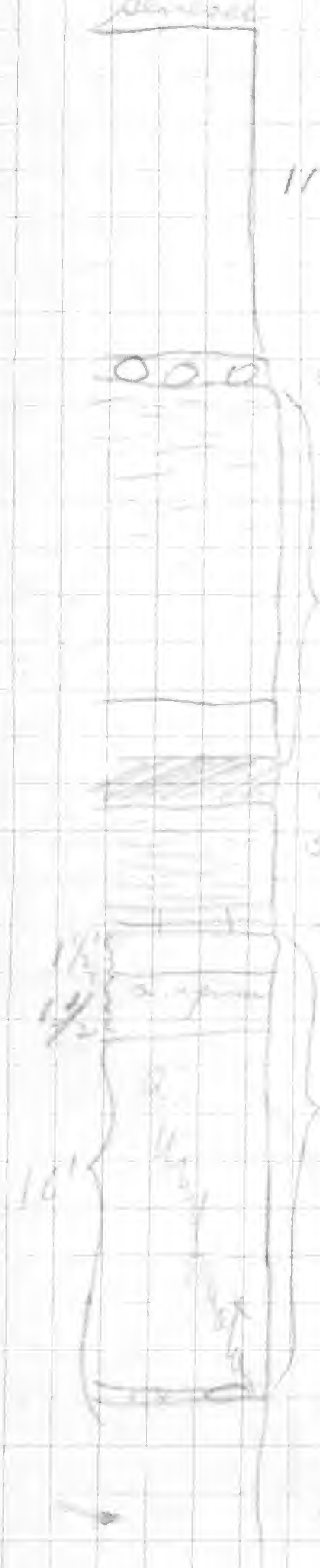
200-213 covered
213-242 7' high - [illegible] typical [illegible] and C. coronata(?)
242-400 covered
400-460 - blue shale capped by a somewhat [illegible] and considerably layer 3' thick.
[illegible]   [illegible]
[illegible]   [illegible]
[illegible]   D. [illegible]
[illegible]
[illegible] the top of the [illegible] approximately to the [illegible] little [illegible] [illegible] a little [illegible] bed.
[illegible] about 152' AT.
460-494 covered

494-510 3' [illegible] shale - no fossils
510-574 covered
574 - [illegible] shale in bank
R. umbonata a   R. [illegible] c

541-578 - mostly covered, a few patches with C. umbonata.
578-610
[illegible] [illegible]: [illegible]
[illegible] [illegible]   [illegible]
Pal. [illegible]   [illegible]

348

Section on Fall Brook



11' black shale

concretions 6'

13' shale

coral bed 1'

19" black shale [illegible]

5' soft [illegible] shale

[illegible] 16

19'

Kashong shale must be nearly 20' thick.

349

350

Fauna between upper concretionary bed & coral bed

R. [illegible] — S. rectum ?
A. undulata c — [illegible]
R. reticularis c — R. vanuxemi
R. decussata — L. [illegible]
P. nana — [illegible] common [illegible]

Also the concretionary bed.

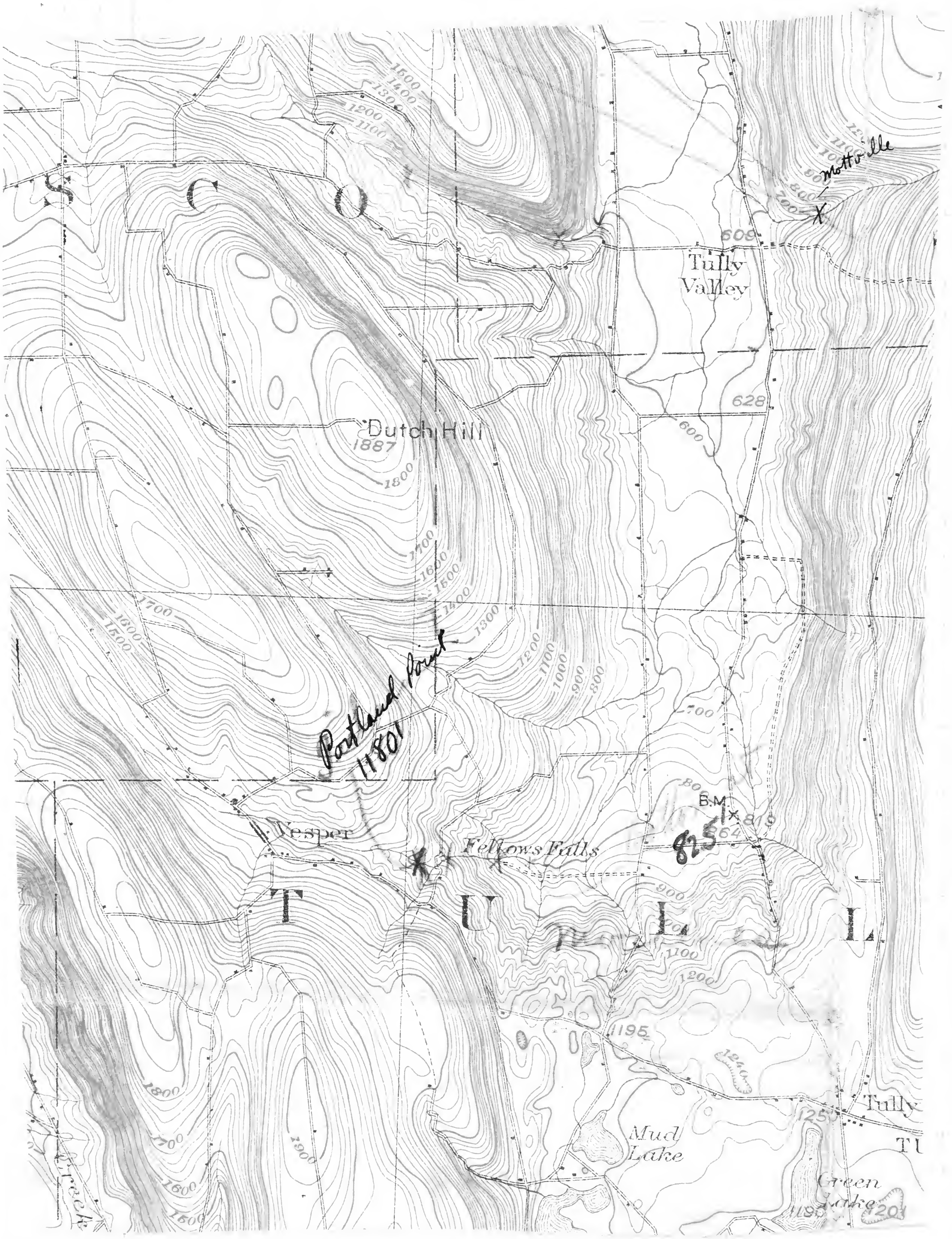
A. spinosa — L. [illegible]
[illegible] — [illegible]
R. vanuxemi — S. [illegible]
[illegible]

From RR at [illegible] [illegible] is 27 degs + 24". The [illegible] the Genesee 87 feet thick

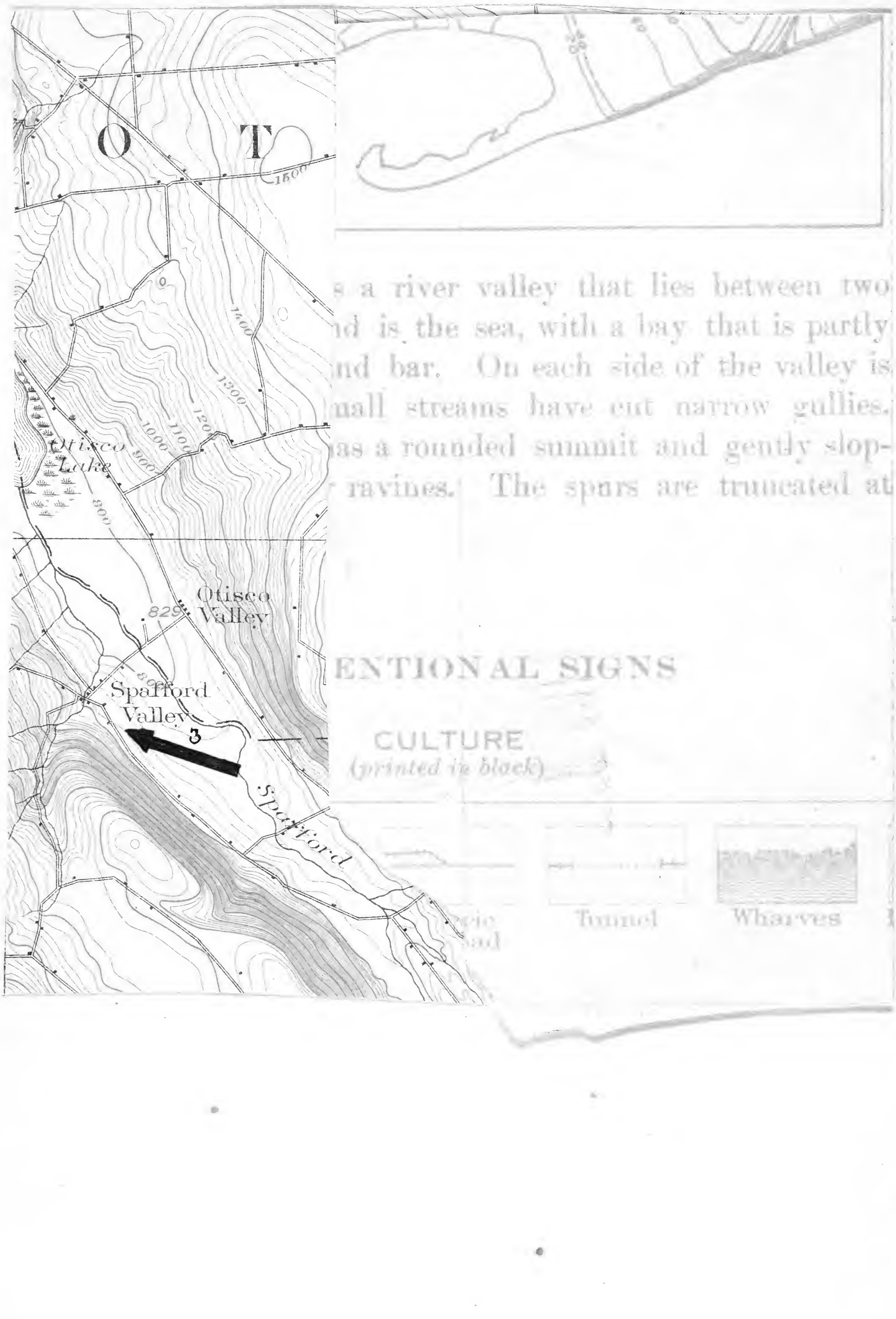
7 5
[illegible]

351

35/a


Mottville
Tully Valley
Dutch Hill
1887
Portland Point
1180'
Vesper
Fellows Falls
B.M.
825
Mud Lake
Green Lake
Tully
T
U
L

3516


O T
1500
1400
1300
1200
1100
1000
900
800
Otisco Lake
Otisco Valley
829
Spafford Valley
3
Spafford

3070

Otisco

O T I S C O

Otisco Lake

Otisco Valley

Spafford Valley

Spafford

Dutch Hill
1887

Vesper

Tully Valley

Mottville

Fellows Falls

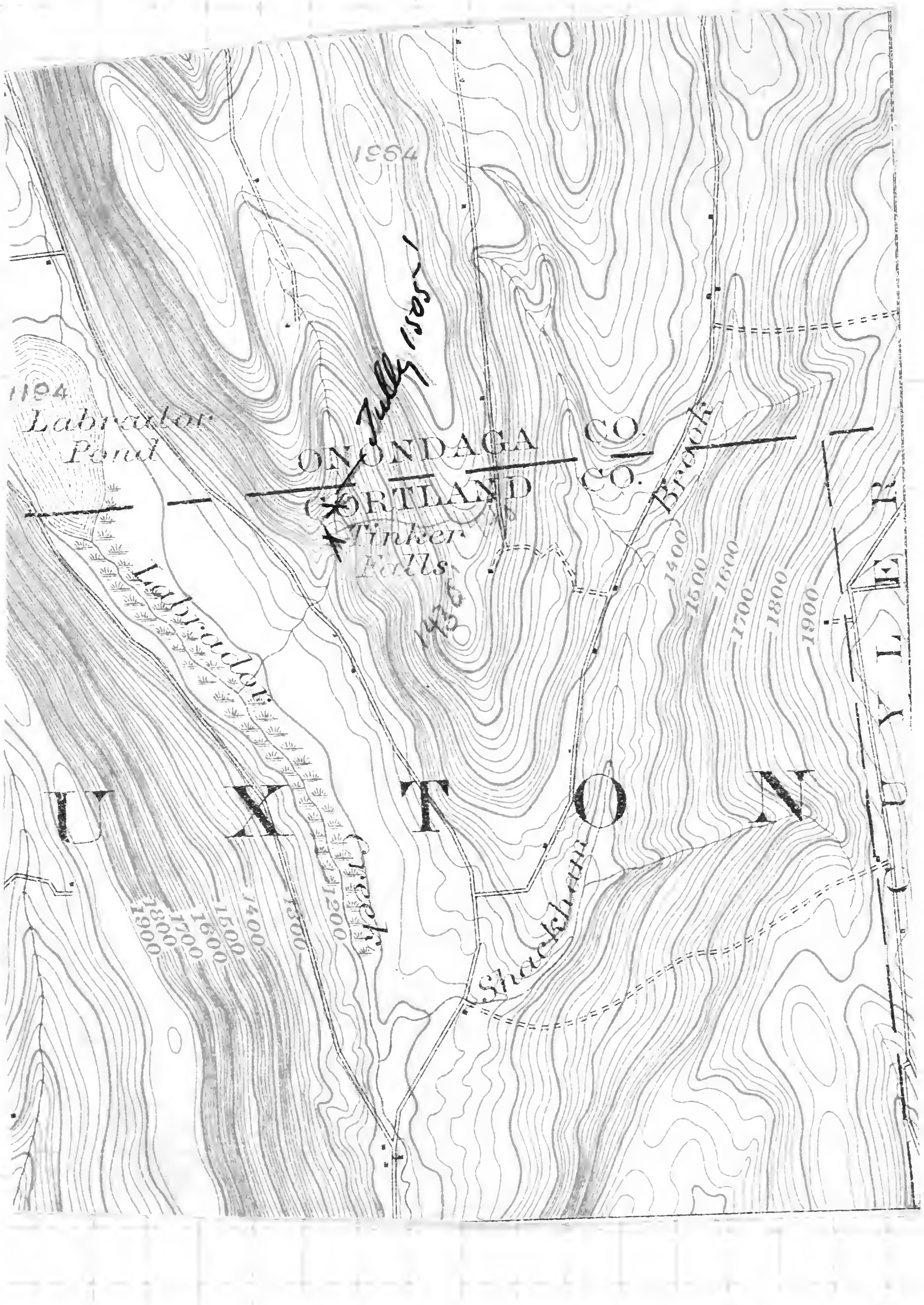
T U L L

1 2 3

352

August 22.

[illegible]


Labrador
Pond
ONONDAGA CO.
CORTLAND CO.
Tinker
Falls
Labrador
Creek
Brook
Shackham
U X T O N
1400
1500
1600
1700
1800
1900
1300
1200
Tully 1505

353

Indian Falls.

1½ mi. NNE of Truxton, Cortland Quad, N.Y.

26
33
59'

65'

354

U. bellistriata.

The upper 4½' of shale are soft and break easily, they are also dark & contain L. [illegible], C. [illegible] & C. subemarginata, N. oblongata.

The C. [illegible] seems only to range for about 3'. The [illegible] & S. fellis are very large.

10'10" — 15'15" — same soft shale, with N. oblongata, Pal. concentrica, C. [illegible], M. subulata, C. indenta, S. [illegible], S. crotalum, R. vanuxemi, A. reticularis, L. laevis, N. bellistriata, Phacops [illegible], Par. [illegible], Lox. sp., [illegible]

15'15" — 20'20" — few fossils [illegible] found

20'20" — 25'25" — [illegible] shale at the top of this interval has concretions filled with sand, also S. fellis, A. fimbriata, R. vanuxemi

25'25" — 30'30" — blue grey shale with C. scitulus, H. [illegible], [illegible], P. [illegible], N. oblongata, S. pennatus, [illegible]

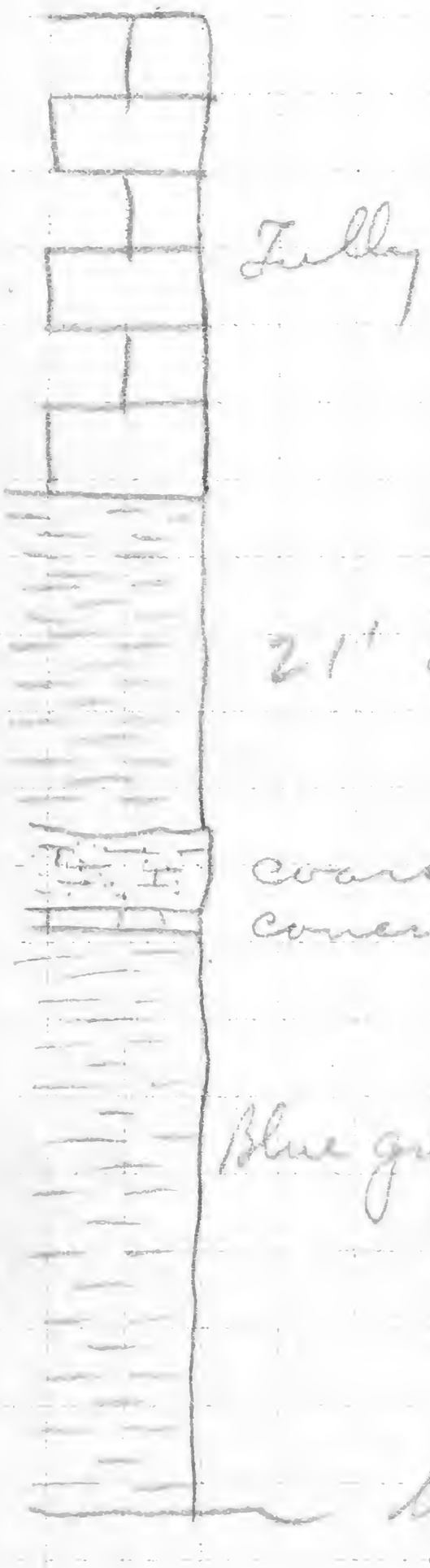
30'30" — 35'35" — blue grey shale with M. mytiloides, [illegible], Pal. concentrica, C. scitulus

35'35" — 40'40" — blue grey shale

40-40 — 45'45 — same

45'45" — 50'50" — the blue grey shales in these intervals are quite sandy and fossils are about only in patches. Between 45'45" & 50'50" were noted C. [illegible], C. ~~bellistriata~~, Lingula sp., Pal. constricta [illegible]

Each square 5'



Tully

21' dark shale

coarse shale 5' 8"
coarse sandy band

Blue grey arenaceous shales. 33'

bottom of falls.

21/5 8

11 8

 355

L. orbiculatus, Eunella sp., ?, P. mutus, A. gonialite, S. pinnatus,

At 50'5" a hard band layer of large concretions or rock perfectly concretionary. Below, fossils the rock is shaley but there are very many concentrations of [illegible]. This contains abundance of I. carinatus.

On this (50'5" - 55'5") appears 18' of hard grey, fine sandy shale. It contains A. sp. (?) [illegible], & black concretions.

55'5" - 60'60 — On this come very dark argillaceous shales which continue to the base of the gully. This shale is almost black, breaks into small flakes, and has practically no grit. It is in marked contrast to the lighter shales below. Fauna of 1st 5' of dark shales: —

✓ S. pinnatus (large)
✓ W. cordiliformis
✓ L. laura
✓ C. setigerus
✓ C. mucronatus
✓ C. lepidus

✓ V. pustulosa
M. pygmaea
[illegible]
N. oblongatus
C. [illegible]

There are 21'8" of these dark shales but only the first 4 or five feet and the last 5' are accessible for collecting. Fossils of the last 5'5" are:

N. varicosa
✓ S. pinnatus
✓ V. pustulosa
I. [illegible]
✓ R. fimbriata
✓ S. sudaculus
✓ A. spiriferoides

C. bellistriata
C. [illegible]
P. nana
A. reticularis
I. carinatus
C. complanata

L. laura does not go up to the base of ZZZ, but [illegible] to lowest 5'

✓

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The shale here is transitional with the Tully.

There is no sharp line here between the Moscow and the Tully except one of weathering. At the creek where the fossil shales are in contact with the calcareous shales of the lower Tully there is a sharp strip formed by weathering about 6" wide which follows the contact. On the dark Moscow comes a dark calcareous shale for 4 or 5 feet. Just above the first step of the Tully the rock was a hard brittle ls. The ls. forming the brink of the falls is floggy and breaks into large slabs. This gives the whole mass the appearance of some of the weathered slabby sandstone masses of the Hamilton. A peculiar stretched Orthis was found in the shaley ls at the contact. I make the Tully here 31-32' thick [illegible]

Bucktail Ravine
Spafford Valley

At the bottom of the ravine just upstream from the highway bridge are found sandy shales that become hard and form a 20 or 25' falls. In the lower part these sandy shales contain M. subulata + L. Clarkei. Somewhat higher up and about 15' below the brink of the falls P. flabellum was common. M. pygmaea was also noted. These shales have the look of the Red Gate horizon well enough.
On the brink of the 1st falls were noted S. subulata c, T. cinnatus Camarotoechia sp.

4 steps above the falls there is a hiatus, then comes dark slightly sandy shales abounding in Tornoceras and other fossils as follows:-

S. ellipticus
✓S. chemungensis
S. pennatus
✓C. vicinna
S. perversa
C. bellistriata

✓T. carinatus
Crinoid stems
Bryozoa (massive)
✓C. lirtilus
P. nana
Aviculopecten sp.

VII

8 steps above the first falls is a small cascade over very hard sandy layers which has the following:-

S. pennatus
R. decussata
Camarotoechia sp.
N. concinna?

S. gradibens
A. spiriferoides
T. cultinatus

VII

8–18 steps – hiatus
At the 18th step come some dark shales probably blue-gray in layers of [illegible] with a [illegible] fossil fauna. They have –

VI

✓ S. demissa c ✓ S. pennatus cc
✓ S. concava ✓ A. reticularis
✓ A. spiriferoides c B. leda
✓ S. perplana
✓ T. carinatus rc

V

Between 19 + 20 steps the following species are recorded in a dark slightly sandy shale:—

✓ S. pennatus cc Buchiola?
✓ A. spiriferoides c A. princeps
✓ N. oblongatus ✓ R. vanuxemi?
✓ N. lirata P. flabellum?
✓ Pal. fecunda ✓ S. demissa
✓ S. concava ✓ C. bellistriata
✓ S. inaequistriata A small coral.
A. decussata ✓ S. perplana
✓ S. granulosus ✓ T. carinatus
✓ Pal. maxima ✓ Pal constricta

V

At 23 steps comes a falls 15 or 20' high composed of hard sandy shales that break into large slabs which are difficult of fracture along the bedding plane. In these were noted

IV

✓ T. carinatus Cyp. tenuistriata
Pal. emarginata M. mytiloides
C. elongata ✓ S. tullius
✓ S. perplana Pal. concentrica
✓ S. pennatus cc ✓ A spiriferoides
Orthoceras sp.

On slabs laying under the falls P. flabellum is very abundant. Other fossils noted in the slabs are:—

IV

P. semele
O. lebrya
N. concentrica

The falls is caused by a hard band with S. concava, T. carinatus, Schuchertella sp., C. mucronatus, P. iowensis, P. flabellum, R. vanuxemi

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Camarotoechia sp, S. perplana, Crinoid stems. This band is quite calcareous & it is not directly on the brink of the fall but is about 9" to a foot thick and is upstream about 25'.

On this band comes softer shales with abundant fossils:—

✓P. radiata c	Pal. tenuistriata
✓S. pennatus cc	✓M. concentrica
B. leda	✓C. scitulus
✓M. pygmaea	✓C. bellistriata
✓N. cf bulliformis	✓N. lirata
✓N. triquetra	✓T. carinatus
✓Pal. tenuistriata	✓S. perplana
✓A. spiriferoides	✓Lingula sp.
Grammysia sp.	Orthoceras sp.
G. arcuata	

III

This layer at least in its lower part is characterized by the great abundance of P. radiata.

Another falls comes about 25' above the 27th step and here there is an overhanging shelf that allows examination of the shale just under the falls. It is dark grey and sandy. The following species were seen in it:—

✓C. bellistriata	✓N. bellistriata
✓T. carinatus	✓S. granulosus
Protolepidodendron ?	✓P. flabellum
✓S. pennatus	✓M. concentrica
N. dekayi	✓M. mytiloides
Cyclodonta sp.	

III

The top of this falls is 160-160 and then comes another about 8 or 10' high. At 32+3 the rock is a hard sandy shale with the fauna given above. Then comes softer shale for 4' but they soon become sandy and heavy again to produce the cascade above.

II

the overhanging falls at 160-160.
Fossils in this cascade are:-
In the lower part
S. pennatus ! cc
M. concentrica
Pa. hamiltoniae
A. erectum
A. spiriferoides

In the upper part - which is sandy
S. devisa
M. concentrica
S. perplana
A. spiriferoides

S. pennatus
C. princeps
S. perversa

At 34 (170-170-1) comes the top of the cascade above the overhanging fall. This is succeeded by still another cascade. The top ledge is somewhat calcareous and produces the cascade.
At 35 comes another cascade about 20' high. Here from 34 to the top of it are blue grey shales. The fauna could not be examined as there was no good place for collecting. The following were noted however:-
N. oblongatus
S. granulosus

T. carinatus
C. situlus
Pal. concentrica

I

The hard band forming this cascade is 28" thick. The 37th step came at the bottom of the hard band. It is hard + arenaceous for 14" but quite calcareous for the other 14". Both the layers give effervescence with acid. Above this to the shales are all blue grey and they go clear up to the Gully.

 Moscow Shale 361

The first 5' of shales contain
S. perplana ✓ ✓ R. vanuxemi
T. carinatus ✓ P. fornicula
P. rana ✓ T. carinatus
C. bellistriata
S. pennatus ✓
S. granulosus ✓

At 5'5" there is a calcareous band
M. mytiloides, A. spiriferoides
At 10'10" T. carinatus is common.
N. triqueter S. pennatus
Pal. concentrica S. tullius
The shale between 10'10" & 15'15"
is somewhat more massive
than that below. Half way between
15'15 & 20-20 there is a thin
calcareous band.
At 30-30 A. umbonata, P. rana,
✓ C. scitulus ✓ S. pennatus ✓ C. mucronatus
✓ Pol. [illegible], ✓ C. bellistriata, ~~[illegible]~~
S. perplana
35-35 – ✓ C. lepidus c, A. umbonata,
✓ C. scitulus
Between 35-35 & 40-40 Chonetes and
Ambocoelia are still prominent.
At 40-40 we have ✓ A. spiriferoides
✓ C. bellistriata, ✓ S. pennatus, ✓ A. umbonata
✓ Pholadops hamiltoniae, P. rana,
C. [illegible], ✓ C. mucronatus, ✓ S. pennatus
✓ Pal. emarginata, ✓ S. tullius, ✓ T. arcuata
40-40 – 45-45 – same
At 50-50 – ✓ T. carinatus, ✓ S. granulosus
✓ A. spiriferoides, ✓ C. setigerus, A. umbonata
(cc)
At 55-55 – ✓ R. vanuxemi ✓ A. spiriferoides
✓ C. incrassata, ✓ R. fimbriata, ✓ S. audacula
Pa. hamiltoniae, ✓ C. scitulus, ✓ S. perplana,
S. rectum / This is probably the
beginning of the Stropheodonta-
demissa zone.

362

 363

✓ H. varicosa ✓ C. scitulus c
✓ G. arcuata ✓ C. setigerus
✓ M. oblongatus ✓ S. granulosus
✓ M. concentrica P. nana
✓ D. carinatus ✓ S. mucronatus
✓ G. capillaris ✓ S. pennata
✓ P. deckerianum A. trabeculata
✓ Cypt. hamiltonense

90-95 — R. [illegible]
From 95-135 — [illegible] — [illegible] at 130' above the T [illegible] the [illegible] with the Gully.
At 120-130-135 — [illegible] band and [illegible] at H. oblongatus,
125-130-140-140 — [illegible], Ambocoelia, P. deckerianum, poorly preserved
130-140-135-145 — [illegible] hard rather sandy — [illegible],
A. cyclas, Ambocoelia, S. granulosus.
S. concava. [illegible] 135-135 140-140
140-140 — 145-145 — [illegible] there has become [illegible] dark at about the middle of the interval from 145-150 150-153+½' the shale is very dark and in places is rusted to a reddish color.
The height from the "Tichenor" to the bottom of the Gully is 163' by my hand level. These dark shales below the Gully are fossil and also the Genesee.
In this dark shale were noted S. tullius, a small Chonetes, a small, D. carinatus and what appears to be V. pustulosa.

The following are recorded from a block of rather soft dark shale

S. pennatus	This fauna is probably from 8'5" dark shale	N. oblongatus
N. triqueter		S. reticostriatus
Aviculopecten sp.		S. perplana
Leioptelia sp.		P. discoideum
L. Ilaura		L. brevirostris
R. fimbriata		N. lirata
Pal. concentricus		P. tenuis
C. aculeatus		S. muntinum
D. cuneatus		L. rostellata
Pholidops sp.		Orbiculoidea
T. carinatus		N. bellistriata
M. pygmaea		C. mucronatus
C. undata		P. nana
I. subemarginata		

Fossils in the 1st 10' of Moscow

B. leda
T. carinatus cc
S. pennatus cc
S. arcuata

A band nodular & band is at 5'5" above T. The first 5' of rock is very hard and difficult to collect. This shale is rather sandy

"Tichenor" 2 layers each ½" thick containing many fossils. Below it a whole set - are Jukeons band 14' thick

Remarks on the Bucktail Ravine 365

At the highway bridge at Spafford Valley are 25 or 30' of rocks that are sandy shales below and become coarse and slabby at the top of the falls. The exact place of these shales in the section I cannot place, but it must be in the vicinity of the coral bed horizon. 43' above the first falls come rather soft shales that bear S. demissa and S. concava in abundance. These should correlate with the rocks at the brink of the 2nd high falls in Fellows ravine. These shales become sandy and a hard band in them causes a falls, which should be the same as that on the sandstone layers at about 250-257 in Fellows Falls ravine. Then comes softer shales abounding in P. radiata, which become progressively sandier till they form a cascade, the water falling over a hard, slabby, heavy arenaceous rock. H. dekayi was noted here and P. flabellum was common. There follow about 4' of softer shale succeeded by another hard band as was seen just below the road bridge at Fellows falls ravine. This shorter interval is followed by soft black grey shales that culminate in a 28" hard band, the upper 12 or 14" of which proves to be the Tichenor. This there is the same sequence that was seen in the Fellows Falls ravine.

This ls is not essentially the same as that noted in the Cayuga Lake section as it does not contain the great amount of crinoid debris seen at that place. It is light blue

 366

grey in color and abounds in fossils. In one place a cephalon and pygidium of H. debeyi was found in the rock.

On this limestone the shale is blue grey and rather hard for the first 5'3" where a nodular band forms a cascade and 15'15" above this another band found forms a cascade. I had difficulty collecting these beds, hence the lists are meager. A. umbonata comes in around 32' above the Tichenor and continues up to a point between 54 and 60' above the Tichenor. On this follows a zone with S. mucronatus, Stropheodonta and A. tullensis, also R. venustula in abundance. This zone continues for about 20-25'. Then come, in all probability, the shales of Cleland's M. pygmaea zone which is so well developed at Sturgeon Glen. There is a 22' talus area in which the shales cannot be examined.

In the base of the falls, of which the Tully is the crown, the shale is hard and practically no fossils could be collected from it. The only collecting done here was between 135-125 and 140-140 where S. consigma was found. This fossil was found below the Tully in Cleland's Spirifer asper zone at Cayuga. At about 158' above the Tichenor the shale becomes dark colored, fissile and much like the Genesee up to the base of the falls, about 8' in all. The dark shale carried S. acuminata and S. tullius. The Moscow section is essentially the same as that seen in Sturgeon's Glen.

37
5
175
163
338
15
353

367

Original No.

Yellow Pine

[illegible]

130

141

97.6

436

90

7 6

6

97

130

11

141

98

43

90

8

98

13

40

98

42

368

Between 70-72 and 75-75 the rocks become very calcareous and have a few corals and Favosites. This is also the very brink of the falls.

Above the brink of the falls were seen for 10' of calcareous rather heavy bedded but ones that split into thin slabs. These beds have occasional large spherical concretions. The only fossils noted in the beds here are:

C. imbricata ?, P. flabellum, Zaphrentis, S. perplana, C. mucronatus, Cyst. hamiltonensis, A. decussata.

At 90 11 the rocks are covered by a softer shale abounding in fossils. The shale from 11' is rather hard and somewhat more massive than that above.

Fossils are:

- ✓ S. [illegible] rc
- ✓ T. [illegible] sc
- ✓ S. perplana c
- P. plana rc
- ✓ C. [illegible] r
- ✓ Par. hamiltoniae r
- ✓ S. inaequistriata rr
- ✓ C. [illegible] r
- ✓ A. fimbriata r
- ✓ C. mucronatus r
- ✓ M. concentrica r
- ✓ A. decussata rr
- ✓ M. [illegible] rr
- ✓ C. [illegible] 2 sp.
- Chaetetes sp.
- ✓ C. corrugata
- ✓ [illegible] r
- ✓ S. divaricatus r
- ✓ R. [illegible] c
- ✓ A. reticularis c
- ✓ A. spiriferoides c
- ✓ [illegible]
- ✓ [illegible] rr
- P. stylopora r
- P. [illegible] rr
- ✓ D. sculptilis rr
- ✓ Gr. hamiltoniae
- ✓ Gon. truncata
- ✓ C. indenta
- S. solenoides ?
- ✓ Fenestellids

The abundance of S. divaricatus here is very striking.

369

90-90-95-95 — In the stream bottom the same shales with bands composed almost entirely of C. [illegible]. An C. complanata and [illegible] were noted here —

From 95-95 [illegible] the [illegible] are the same but [illegible] just below the falls fossils [illegible] and [illegible]. [illegible], A. reticularis, and C. [illegible] were abundant [illegible] within 8 or 10' of the bottom of the falls. Other species observed are:- S. [illegible], Orbiculoidea sp. [illegible] St. [illegible]

At the top of the falls which is at 130-130 [illegible] of the [illegible]. The 10' falls is formed by a hard sandy layer that contains S. mucronata, A. princeps, C. [illegible]. The hard [illegible] band is 3 or 4' thick and [illegible] the shales that contained S. [illegible] & A. reticularis in such large numbers.

The coral bed is between 6½ and 7½ thick. It consists of a dark, rather soft shale in which the corals abound. [illegible] and Cystiphyllum are the [illegible].

The shales in the coral bed are a blue gray like [illegible] shales and abound in C. bellistriata. Other fossils noted were:-

M. subalata
L. laevis
C. bellistriata
N. oblongata
Orthoceras sp.
Pal. constricta
N. [illegible]
B. [illegible]
N. [illegible]

370

Right near the coal bed C. spiniferida and S. pennatus were noted. A horizon with C. bellistriata and L. [illegible] was found in the middle of the 100' falls of [illegible]. The Eppincardella come from about 150 or 155' above the coal bed.

At 150 [illegible] [illegible] seemed to be very fossiliferous [illegible] [illegible] was observed.

C. [illegible] ✓ [illegible]
N. obligatus ✓ [illegible]

These are in a dark blue somewhat sandy shale.

Between 195-200 & [illegible] the following were seen:—

✓ C. spiniferida — N. [illegible]
✓ S. [illegible] — N. obligatus
✓ N. [illegible] — B. [illegible]
C. [illegible]
✓ S. pennatus

Between 205-205 & 210-210 — the following were seen:—

R. cyclas — C. spiniferida
✓ [illegible] — N. [illegible]
✓ R. [illegible] — ✓ S. [illegible]
✓ S. pennatus — ✓ [illegible] constricta
✓ N. obligatus — C. [illegible]
✓ A small crinoid — ✓ [illegible]
✓ [illegible] — ✓ S. [illegible]
✓ [illegible] — ✓ [illegible]
[illegible] — P. [illegible]
✓ A. [illegible] — ✓ [illegible]

The falls above the coal bed is fully 80' vertical. Beyond this is another smaller falls.

215-225 - 220-220 — coarse sandy heavy bedded shales with following
P. flabellum, ✓T. carinatus, C. bellistriata
L. [illegible] ✓S. pennatus, M. concentrica,
Pal. ~~con~~ strata, ✓N. elongata, C. cf. prolifica,

220-220 - 230-230 — coarse shales breaking into large slabs. They have a prolific fauna —

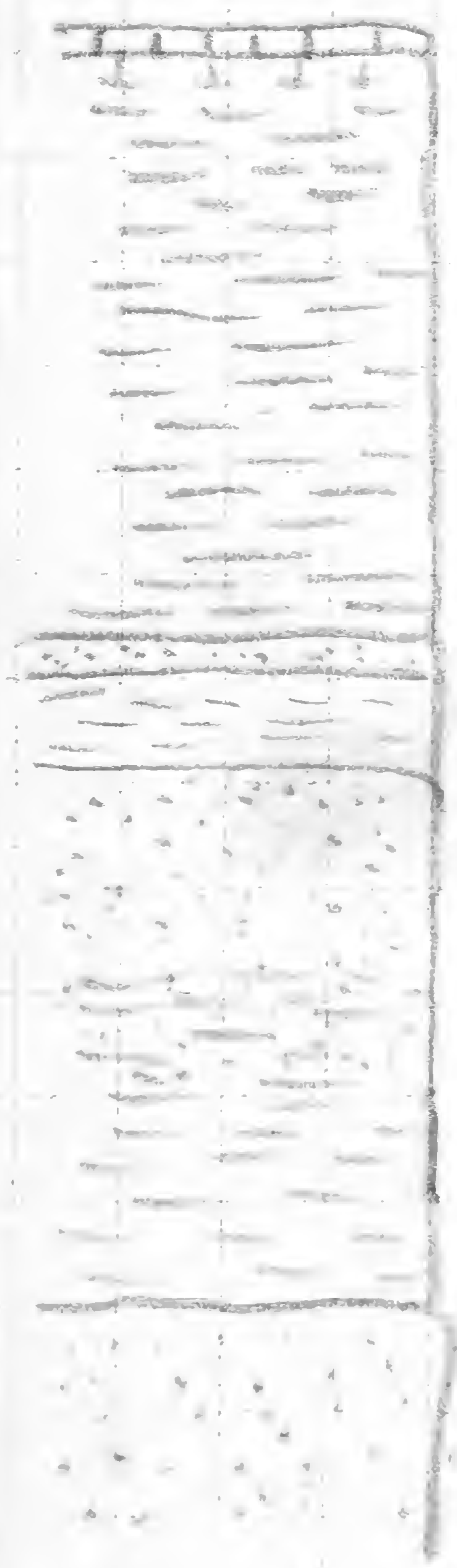
P. flabellum
✓T. carinatus cc
✓C. coronatus
✓S. pennatus cc
Pal. emarginata
✓C. [illegible]
M. concentrica
✓A. spiriferoides

The S. pennatus are very large indeed
The bed forming the first cascade here is not only sandy but is calcareous.

Below [illegible] 230-230 + 235 at the falls [illegible] [illegible] sandy and [illegible] in large slabs. [illegible] found S. [illegible] S. [illegible], Fungella sp. [illegible] and [illegible] of a P. dekayi
At 250-250 — [illegible] bed [illegible] 1'-15" thick. [illegible] has fossils, Spirifers & S. [illegible]. [illegible] shales. The sandy beds are 4" thick from the [illegible] beds. [illegible] there are probably [illegible] shaly ss beds and [illegible] 25 or 30' of ss.
The blue gray shales in the sandstones contain the following fossils — T. carinatus cc, N. oblongata, C. [illegible], C. [illegible], S. [illegible], Pal. concentrica, N. lirata, N. varicosa, S. pennatus cc, M. concentrica, N. [illegible], C. bellistriata, Pal. fecunda.

372

Section at Falls below highway bridge & also west of it.



1' Siliceous ?
14" calcareous sh ? - - - - - 330'

27'

1½' hard calcar. arenaceous band
sh. 3'

27'

Top of ss horizon
270' 10"

Each square
5' 5"

373

The ls. crosses the stream in ~~a 2~~ an 8 or 10' cascade 300 paces from the highway bridge. The rock is very coarse and contains many Crinoid stems. It also has:—
T. carinatus
S. pennatus
C. scitulus
At the falls the ls. bed is about 1' thick
The 300 paces upstream represents 27' by hand level.

At 280-280+2 (3) comes the top of the rock below the highway. This makes a ~~total~~ total of 303
The falls at the top under the bridge is caused by a band of calcareous arenaceous band in two layers 9" thick each. Below it are about 3' of dark bluish grey shales. This band rock contained S. plumatus. Two large slabs ~~below~~ below the falls and probably from the horizon contain —

S. plumatus (?)
T. carinatus
C. commatus
A. princeps

H. dekayi
S. perplana
S. cf. [illegible] (?)

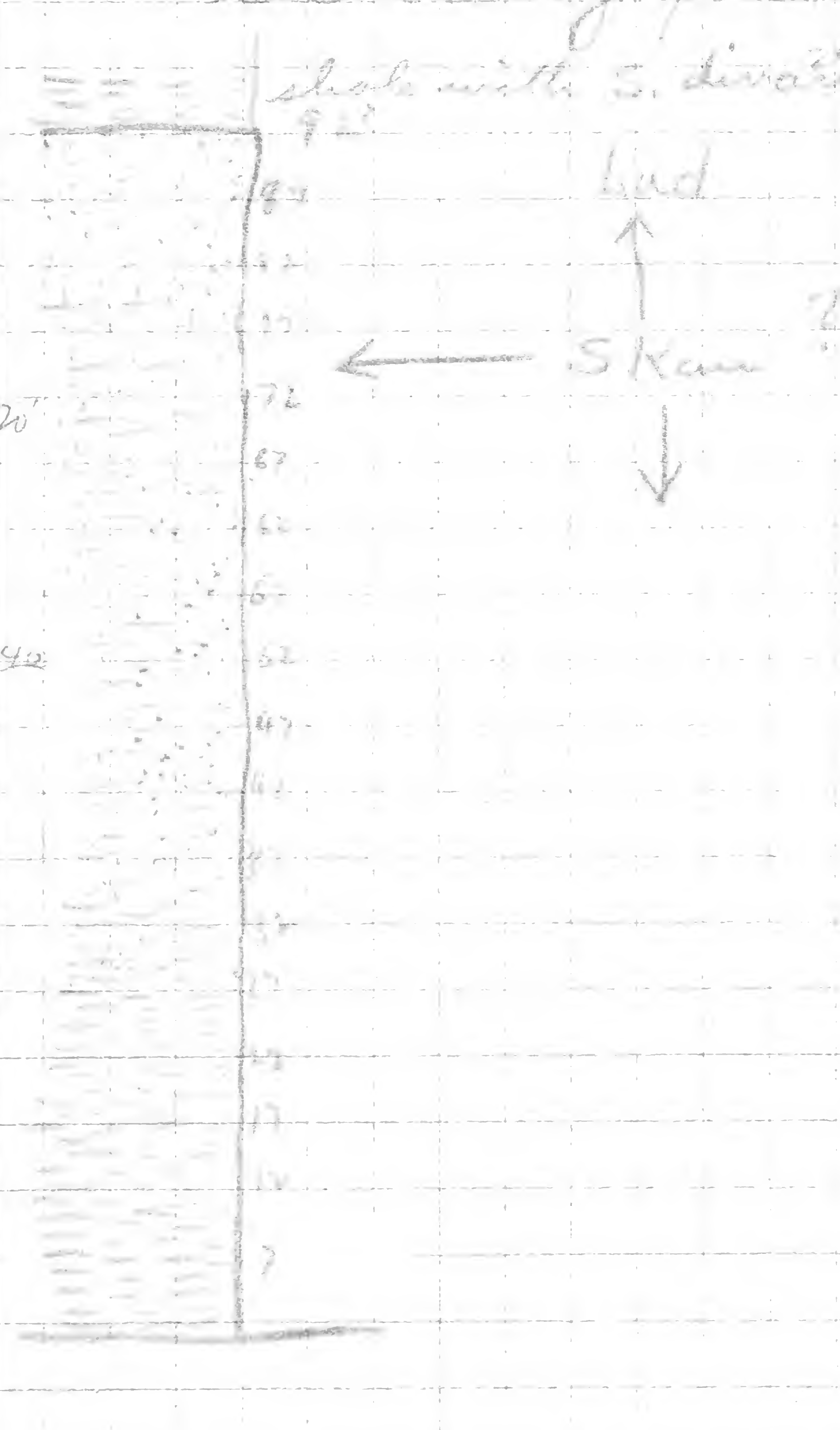
I believe on looking at the ss beds again that they begin as much as at 230-23(6) and go up to 250-250 minus 2', and thus are about 19 or 20' thick. They probably belong to the University Quarry horizon.
Below the ss are sandy shales which continue down to the Strophodonta band at the top of the big falls above the coral

374

horizon. Below this to the coral beds the shale is less sandy and may belong to the lower Ludlowville shales in Patterson's Glen or Randallsville Gorge.

The shale with S. devisa and C. bellistriata continues to 225-225 — 230-230 as representatives were found here. Above this come the ss. which are shaley for 5 or 10' judging by their weathering but become slabby at around 235-235

Section of first Falls



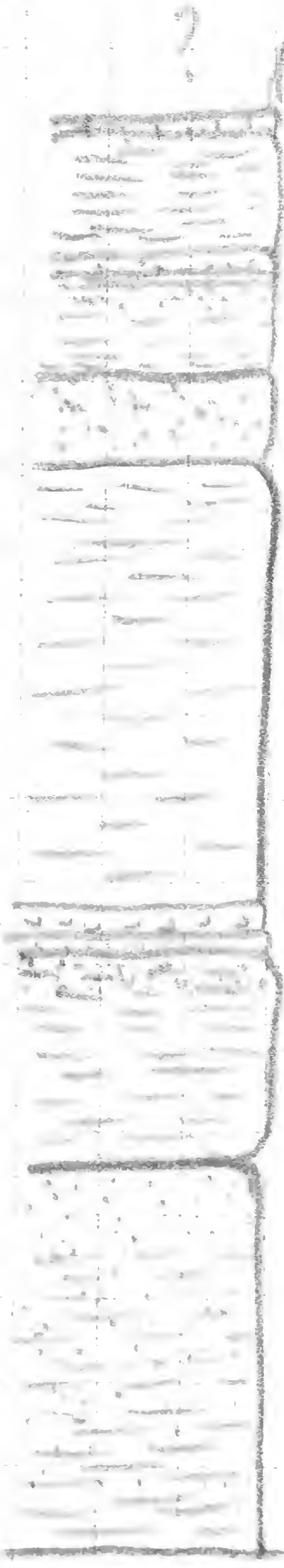
Remarks on the Ludlowville

Before coming to the falls the sandy beds that break into thin layers and appear so much like fissile shale were noted. Then there is a hiatus until practically the end of the sand is met. Actually the stream crosses the road, altho it is not indicated on the map, and just beyond the crossing are found dark soft shales, decidedly belonging to the Skaneateles. These have a distinct "Skaneateles of the west" aspect. The fauna continues as a typical brachiopod fauna for about 65' from the bottom at the hill bank where the first soft dark rocks were met. At this level L. centrum was found and with S. granulatus, P. lirata, S. capillaria but also S. [illegible]. About 25' up the shale is a ss and continues so for 15 or 20'. At the base of the ss is where I believe the line should be drawn altho Luther does not say in his text just where the line is drawn. It is possible that it is drawn at the sandy beds below the dark Skan. shales but this is not likely. No collecting could be done in the ss.

On the ss comes a soft shale abounding in S. divaricatus and other fossils. This may be where the Gypsum quarry enters, if it is not Skaneateles. Above the shale comes a hard band and of the [illegible] coral bed. On the coral bed, which forms the base of ~~the~~ second large falls, the ~~strata~~

1180
870
310

Ludlowville section.



?

Tichenor 1' } cascade west of highway

27'

34' cascades 230-230 – highway & beyond

22'

210-210

101' } 2nd high falls.

–130-130

7' coral bed } 2nd cascade
3 or 4'

49' Shale with A. reticularis & S. divaricata at bottom (43) ?

20
49
7
3
101
22
34
27
263

92' } 1st falls

about 880 contour Each square = 20'

376

are blue gray and about 10' above the coral abounds in C. bellistriata. The face of the falls could not examined except at the top & the bottom as the face of it could not be scaled. On top of the falls C. laminosa, & E. concava were found. They layer with Cypricardella below & Stropheodonta above is between 100 and 105' thick. On this comes about 20' of sandstone with spherical concretions & P. flabellum which are probably in the same horizon as the U. [illegible] and they look like that stone. Then comes a soft shale that passes into a sandstone, 32'; on this soft shale again with a prolific fauna 27' and this is capped by a hard band of ls. a foot thick. This stone appears thicker downstream due to calcareous shale band below.

This ls. has not the look of the Tichenor elsewhere but has some of its fauna. It is the first stone in which Camarotoechias were seen in any abundance.

On Letter B. 230' of contours are represented by the [illegible] Ky measurement is 200' by hand level & [illegible]. It is impossible to tell just where the base line lies. If it is near the Stromatolite below because nearly it would add 6 or 7' to the measurement.

S. [illegible] was only found in the lower 2 or 3' of the shale in which it occurs. A reticularis ranged up to 10 or so feet of the coral bed. There are difficulties in assigning this to the

377

New Gyps horizon.

I noticed no beds with many Camarotoechias or small Spirifers as we have them in Madison Co. The zone with E. linklaeni was not seen, nor anything like the Centerfield ls, unless the beds with S. divaricatus and A. reticularis be it. The coral bed would properly go with the Centerfield equivalents, and the shale at top would go with the Pattersons glen fauna. It will be noted that in some ravines at Erieville S. deminsa with a Leiorhynchus fauna was found. The Gyps beds, and the Electric light & Steam horizon are still mysteries. I do not believe that they are Skaneateles for I have seen zones in the Skaneateles with H. arguta, large Spirifers, P. laxita & others more commonly seen above.

The beds from 250-250 minus & up to the "Tichenor" (?) I believe belong to the Red Gate horizon.

 378

Sept 4.

About 2 miles S of Keeny on the opposite side of the valley (East) is a quarry about 15' vertical of soft dark blue gray shales. The fauna indicates that the beds are in one of the Ambocoelia zones.

C. lepidus
G. subcarinata cc
[illegible] spinosa cc
C. boothi
O. undulata
C. mucronata
P. [illegible]
R. fimbriata
M. sublata
N. [illegible]

S. [illegible] c
P. [illegible]
C. [illegible]
Pa. [illegible]
[illegible] cc c
[illegible] c
[illegible] c
R. [illegible] c
C. bellistriata c
C. crenata c

The rock crumbles easily into small irregular clearly fragments.

August 23, 27.

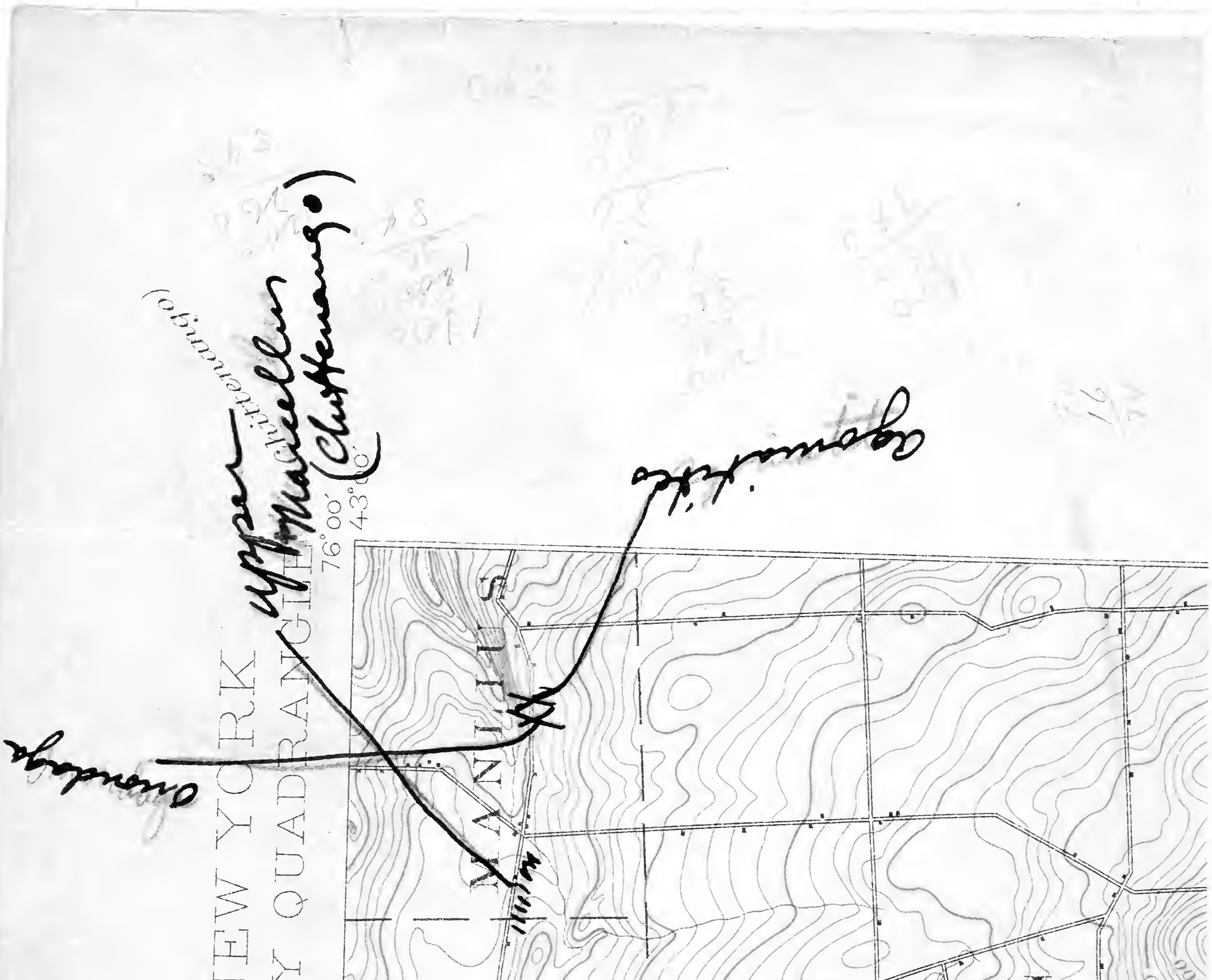
Road between Jamesville + Manlius

Along the road about 2 miles East of Jamesville the Agoniatites was seen. It is here about 40" thick in 2 layers defined by weathering color. The lower layer is about 14" thick and is a limestone of gray even, smooth texture with conchoidal fracture. On the surface it weathers to a light ashen grey. The topmost layer is 26" thick and is much darker, with a rather hackly fracture and much seamed by horizontal and irregular cracks. This upper stone has also many orange rust spots in it. I also found most of the fossils in this layer. at the junction of the two layers small crinoid stems and tiny brachiopods were accumulated in places.

Between the Onondaga and the Agoniatites there are 2' 8" of black shale with some black ls bands much as in Madison Co. This was measured by hand-level.

The upper surface is somewhat shaly & contains snails congregated in places + other small fossils.

East of this exposure, road continues up the hill and forms the flat hill there. Upper Marcellus shales are displayed on the hill about 1/2 mile east of Agoniatites outcrop. The shales there are the same as those in Oneida Co. They also have the peculiar pitted surface


NEW YORK
TULLY QUADRANGLE
76°00'
43°00'
MANLIUS
Jamesville
Reservoir
B.M. 645
B.M. 708
974
1280
upper Marcellus (Chittenango)
Onondaga
Agoniatites
Top of Onondaga

 380

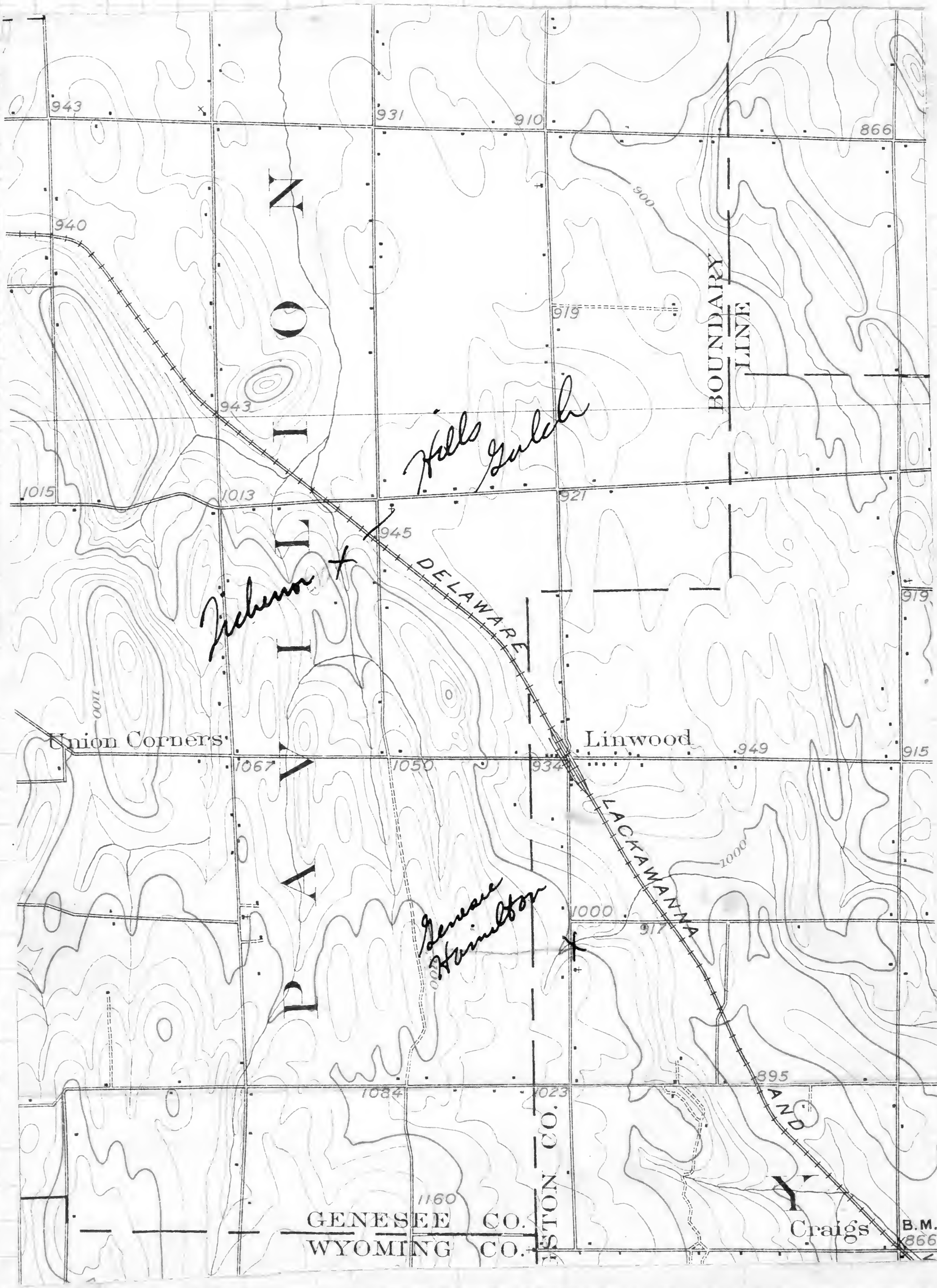
on small flakes. The Agoniatites breaks into ~~small~~ chunks of irregular lumps.

Just east of the first road intersection east of the first Agoniatite outcrop noted and about 5½ miles east of Jamesville is another that exhibits most of the shale and ls. below the Agoniatites + on the Onondaga. The Onondaga may be seen in a small gully north of the road in the hollow between the Pompey road and the hill, and just west of the yellow house at the foot of the hill.

The lower layer of the agoniatites here 5" holds ~~together~~ in contrast to the upper layer which is here crumbled to bits. The weathering of the upper layer brings some of the fossils into relief. Cephalopods are not as abundant here as in the Oneida Cut region.

P. fragilis was noted in the shale and ls. below.

360a


943
931
910
866
940
900
943
BOUNDARY LINE
919
Hells Gulch
1015
1013
945
DELAWARE
Richmond
919
1100
Union Corners
Linwood
949
915
1067
1050
934
LACKAWANNA
1000
1000
917
Seneca Hamilton
1100
895
AND
1084
1023
1160
GENESEE CO.
WYOMING CO.
LIVINGSTON CO.
Craigs
B.M.
866

381

1918

Aug. 5

Hill Gulch

Gilmore 550 paces upstream from bifurcation

edge is at the falls.
lowest 5'5" — blue grey shale
S. pennatosa.

About 3' above stream bed is a calcareous bed 3" & 4" thick this contains

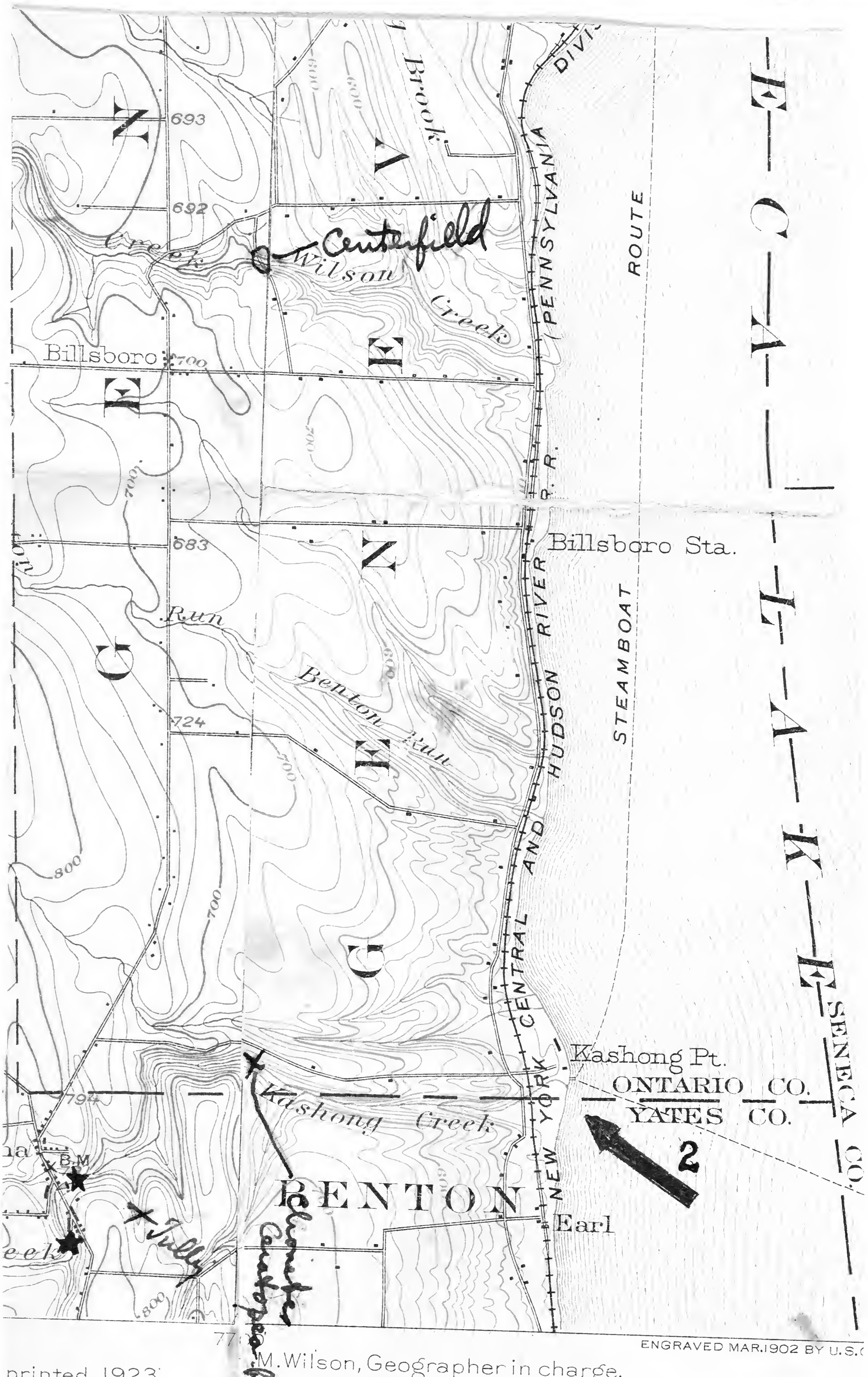
M. hastinsi — L. rana
[illegible] — M. concentria
A. [illegible] — C. [illegible]
P. [illegible] — L. [illegible]
P. [illegible] — S. [illegible]
A. [illegible] — C. [illegible]
C. coronatus — S. pennatus
C. mucronata — P. rana

The next 6½' shale becomes very fossiliferous
Heliophyllum — C. [illegible]
P. [illegible] — L. [illegible]
H. hastinsi — A. spinosus
L. [illegible] — P. [illegible]formis

This shale is capped by 9-15 inches of hard brownish grey & [illegible] limestone

382

382a



ENGRAVED MAR. 1902 BY U.S.G

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M. Wilson, Geographer in charge.
ntrol by W.T. Griswold and J.H. Wheat.
opography by J.H. Jennings.
Surveyed in 1899 in cooperation with the State of New York.

PHELPS

August 7 [1927]

Kashong Creek Section

+60 paces from the highway bridge is to be found a small exposure of dark grey shales in the bed of the creek. These have a conchoidal fracture on the bedding surface and are very slightly calcareous. These bear a very sparse fauna –
P. fragilis c
L. leda r.

At 520 paces shales are revealed for about 10-15' vertically. These are dark blue-grey and carry the following fauna for 10' vertically

D. truncata r ✓
Paralleledon ham. ✓
P. concentrica c ✓
M. concentrica r ✓
A. umbonata ✓
Lox. hamiltoniae
S. truncata ? ✓
Buchiola sp.
A. spiriferoides ✓
Orthoceras sp.
P. stylopora ✓
C. bellistriata c
C. boothi c
P. rana r
" setigerus ✓
C. lepidus
S. palmatus rc
S. capillaria
Camarotoechia sp.
S. rectum ✓
S. perplana ✓

This bed also contains many concretions.

Between 700-800 paces there is a bank of shale that is easily 60-70' vertical. The shale is very dark, almost black, fissile and much jointed. It is an easy matter to take large blocks and with one blow shatter them into a mass of flattish chips. The shale in places is fissile breaking into paper thin flakes. Between the joint planes and along the bedding seams small

gypsum crystals have been deposited. Fossils are very rare at least in the lower 10' only which were examined. Here were noted
S. fissurella
P. fragilis
In the stream bed large irregularly rounded oval, or elongate concretions of $CaCO_3$ protect the shales from the weather and the wear of the water. Pyrite concretions are also present here.
Between 972 and 1030 paces these same shales are exposed in a steep bank. Here additional fossils were seen:-
S. truncata T. subemarginata
Orthoceras sp. R. retrostriata
E. rugulata ? Pterinopecten sp.
N. triqueter
At 1200-1275 paces is another exposure of these very dark fissile shales. Their appearance is like the Skaneateles shales. At this exposure the fossils noted are
A. umbonata Buchiola
B. [illegible] T. subemarginata

At 1030 paces in some spherical concretions there were many Loxonemas.
The fauna in the bed, 4' 5' up, of the stream from 1400-1450 paces follows:-
S. pennatus c Pal. fecunda
P. stylopora vr N. corbuliformis
C. boothi c Ostracoda Spirifer sp. ?
Pal. concentrica c O. parvula
C. bellistriata S. rectum
Par. hamiltoniae C. scitulus
A. umbonata c P. discoideum
P. rara r N. lirata
Orbiculoidea sp.
This fauna and the rocks are the same as those seen at 520 paces. This is either a recurrence of this fauna or a fold that duplicates the strata. The very closely spaced jointing in the rocks so far up the creek suggests the latter

385

These dark friable rocks are exposed above this Plemrodictyum bed clear up to 1900 paces, where P. rana was fairly abundant in the rocks just above stream-level. At 1900 paces a vertical cliff of 80 or 90' shows a long section of rock. At 1750 paces some of these quite shaly were found weathered and here they are olive colored. I fully believe that a small fold has duplicated the Plemrodictyum bed.

At 2025 paces in the bottom of the falls here the bank level was reached. Found at the 1st 5'5" of shale - the bottom 2½ - 3' had practically no fossils

C. scitulus	P. rana	at 5'6" C. platyporus
L. laura	Orthoceras sp.	C. constricta
P. fugilis	S. pennatus	P. constricta
S. fissurella	C. setigerus	B. leda
Buchiola	D. carinatus (small)	

5'5" – 10'10" — B. leda, S. truncata, M. pygmaea, A. umbonata, L. laura, N. triquetra C, C. setigerus Lox. hamiltoniae with shale concretions

10'10" – 15'15" S. pennatus, C. congregata, Orthoceras sp., These shales have a faint gritiness to the ~~teeth~~ and effervesce slightly. They are thus silties here at 15'15" and more calcareous than those below. Also, N. lineata, Orthoceras sp. and Lox. hamiltoniae with a concretion forming about it. These were common just below.

15'15" – 20'20" — S. perfalcus,

20'20 – 25'25" calcareous bed yielded:— at 25'25" a

P. rana	S. undulatus.
Lox. hamiltoniae	Cryptonella
D. carinatus (transverse)	A. Lloydi
D. gibbosa	M. lineolatus
S. pennatus	M. concentrica
S. arctostriatus	M. oviformis

386

✓E. linkletteri
✓R. fimbriata
✓S. perplana
S. muticum
Platycerus sp.

D. limbata
✓L. decora
C. vicinus
S. inaequistriata
C. coronatus
D. lineatum

25'25" – 30'30" The rock in this interval is specially characterized by C. vicinus and P. carinatus. Other forms are

Grammaria sp.
✓D. lepida
P. petulus

✓S. permatus
C. coronatus
Bryozoa.

30'30 – 35'35"

✓S. permatus
✓S. inaequistriata
✓D. carinatus
✓R. vanuxemi
✓M. oviformis
Platyceras 2 sp.
Ambulopecten sp.
S. fimbria
✓Cystodictya sp.
✓Pal. Constituted
Conchostraca

✓R. fimbriata S. muticum
✓A. spinifaciens
✓S. perplana
✓M. hoskinsi
P. rara
S. muticum
Lichenalia sp.
✓A. decussata
✓Pal. marginata
✓C. vicinus.

These shales weather to a blue grey and are distinctly lighter than the le of the bottom of the falls.

35"35" – 40'40" –

✓S. permatus
✓Cystodictya
✓S. perplana
✓D. limbata

Platyceras
✓D. carinatus
Zeuestellidae
Lichenalia sp.

✓S. inaequistriata
✓R. vanuxemi c
✓D. lineatum c
P. macrocystosa

40'40" – 45'45" –

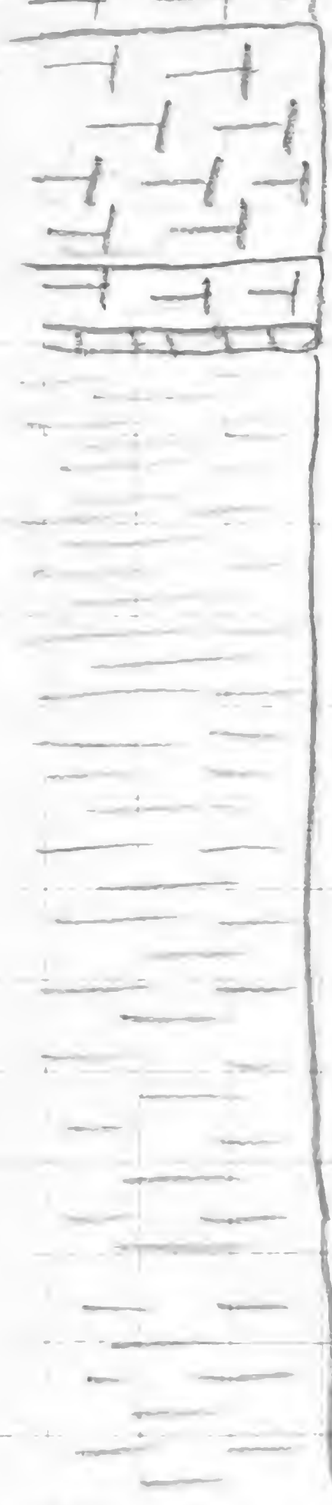
S. permatus
✓P. stylopora
Bryozoa ccc
✓Chaetetes
✓S. inaequistriata
✓S. perplana
P. rara

✓R. vanuxemi
✓S. muticum

45'45" — 70'–70" is 1½' above the Lichenal

387

Section at the Middle falls - Kashong Ck.



calcareous sh - many fossils

6' Calcareous sh with few fossils

1' Shaley ls. with A. decussata + D. limeatum = Tichenor

35' 1"

Shale, rather calcareous 27' 1"

Stream level

Bottom middle falls.

From the bottom of the lower falls to the top of the Tichenor is 74' 4"

I assign the bed containing Cimoid stems and very hard under the hammer to the Tichenor. This is at slightly ~~lower~~ than the crest of the falls, but there are also a few remnants of the bed just above the crest. This bed here has some shale in it, but is mostly a hard grey ls. It has:-

L. macrostoma?
L. penumbra
A. decussata
A. spiriferoides

Bryozoa

The bed just on the Tichenor and 1' thick has

D. limeatum ? c
A. decussata c
L. angustus
P. rowani.

Amplopora sp.

388

In the calcareous shale 6' thick I noticed no fossils but crinoid stems but on this layer there is another charged with fossils.—

This has :—

✓ S. inaequistriata	M. concentrica
✓ S. macronotus	P. rowi
D. lineatum c	T. exigua
Platyceras	Camarotoechia 2 sp.
A. princeps	S. tullius ? (Plate)
	Gennaeocrinus sp.

This bed is a hard shaley ls. grey in color and weathering to a light grey. Bryozoa are the predominating forms. The bed forms a bench along the creek floor for:

H. halli	✓ R. fimbriata
Favosites	S. mucronatum
Lichenalia cc	✓ P. pavilionensis
✓ S. audaculus	✓ S. macronotus

About 350 paces upstream the hard calcareous rocks have passed under the stream. Of these above the Lichenalia there must have been about 15'. The beds that disappeared at about 350 paces were very fossiliferous but the fossils were difficult to procure. From this elevation on shale rocks prevail. These are dark blue-grey like the Earlville rocks and give a vigorous effervescence with acid. They offer a faint grittiness to the teeth.

At 397 paces, 5' above stream level were found C. bottii, + Orthoceras with R. stolonifera. Taonurus

At 470 paces P. tennis; 496 in debris, Pholadomya cylindrica

At 583 paces a falls occurs over these blocky coarse shales. Fossils are very few here. Only a

Pterinopecten was found, but a 389
T. carinatus was noted in the debris.
a large Grammysia
At the top of the 3rd falls is hard ls. band a little more than a foot thick and contains S pennatus and C. scitulus. The falls is 27' high + 3' to the top of the ls. 57 paces above the falls or 640 paces from top of Tichenor the shales are soft and blue grey breaking into small flakes. The rock contains T. carinatus and small concretions containing also T. carinatus not unlike those seen above the Menteth ls.

Here are
S. granulosus — C. coronatus
T. carinatus cc.

At 648 paces in the stream bed there is a band of ls. containing the following species:-

S. granulosus cc — Camarotoechia sp.
S. inaequistriata — Cent. impressa
P. rana — C. bellistriata
A. spiriferoides
R. vanuxemi c
E. linckloeni

It is a hard shaley ls. and is about 3' above the hard ls at the top of the Menteth falls. On this are about 10' of shale and then there is another band band of ls. In the intervening rocks between these 2 ls. are found.

√ T. carinatus cc — C. bellistriata
Cystodictya sp — Palaeoneilo sp.
√ S. pennatus — √ C. scitulus
√ C. coronatus — O. undulata
√ S. perplana — Grammysia sp.
T. bellulus — G. bisulcata
C. boothi var callitetes — C. tenuistriata

Pal. concentrica 390 L. marcyi
P. nodocostata

at 731 paces there is a cascade in the stream about 5' high. Thus in 83 paces the stone has dropped about 5' but it rises again being about 3' above stream level at 814 paces above the Tichenor.

Just below the calcareous band containg the cascade fossils are numerous and here were found

S. peoplana
Modiomorpha sp.
Cyrtodieta sp.
H. cainnatus
C. coronatus
H. dekayi

Q. spiniferides
S. pennatus
S. concava
C. vicinus
R. vanuxemi

This 10' of shale contains also many concretions.

Bridge is at 814 paces upstream from Tichenor

 391

August 8.
Bellona

Rain all morning; took trip into Penn Yann to ship package and notes. In afternoon worked under dam. Here about 15' of rocks are displayed below the Tully ls. which is well exhibited.

In the floor of the stream are slightly calcareous shales which crumble easily. Here are local lime concentrations in the form of concretions and local layers of fossils. A. reticularis is specially abundant here, along with S. rectum. Fauna in ~~18''~~ 13' feet below Tully.

A. reticularis cc.
Chaetetes
S. perplana
P. emarginata
C. boothi
R. vanuxemi
Blastoid (Nucleocrinus)
R. fimbriata
C. sappho ?
C. setigerus
C. scitulus
M. concentrica
D. lineatum
A. princeps
Gennaeocrinus
P. rana
C. indenta
S. inaequistriata
Lox. hamiltoniae
A. spiriferoides r.
T. carinatus
C. bellistriata
Pal. concentrica
Pal. plana
Aviculopecten sp.
Loxonema delphicola
Platyceras sp.

392

Fauna in first 6' below Tully.

N. pygmaea
I. subemarginata
Certatoposis
S. tullius
N. corbuliformis

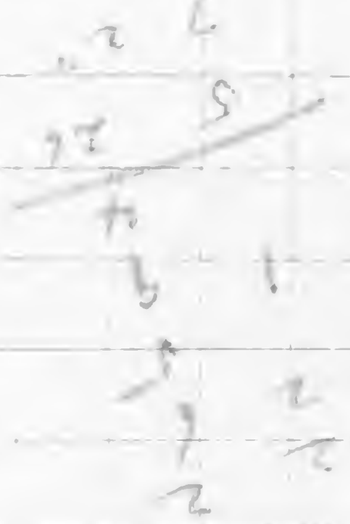
The shales here are dark, fissile and not unlike the Sandusky. They break into small chips. The fossils from the Tully are all small & dwarfed and many are pyritized. Pyrite is also very common in concretions.

From 6'-6½' below the Tully this half foot is crowded with fossils -

L. laura c	N. corbuliformis
M. subalata c	S. mantium
S. tullius c	I. subemarginata c
Lingula sp c	Orthoceras sp.
C. bowthi	S. andaculus
D. capillaria	P. marginata
N. oblongatus	B. leda.

6½' - 11'5" below -

S andaculus	c I. corrugatus small 7' below
C. bellistriatus	Cam. hamiltoniae
S. tullius	M. subcancellata rr
Lingula	
N. lirata	
C. scitulus	
V. pustulosa?	
M. oblongatus	



393

11'5" – 13'5" –

C. situlus c
T. carinatus
T. subemarginata
C. setigerus
Cron. hamiltoniae
Pholidops ham.

Leiopteria sp.
Pal. emarginata
R. vanuxemi
C. bellistriata
N. bellistriata

Between 13' + 15' below the Tully
A. reticularis, the corals and byozoa
come in. Also in this interval the
shales become less fissile. It may
however be because they are nearer
the stream + less subjected to the sun.
There are here 18'3" of shale exposed
below the Tully.

Tully

Mounts the Moscow. Under dam
appears to dip to south but probably
reverses its dip and appears upstream
again dipping north. thus making
here a shallow trough. It consists
of 6 layers, the lowest one is 2'2" thick.
The next is 5" thick, the next is 2½'
the next 1'9", and the last which is
shaley & bears corals is 3-4". This
makes the ~~total~~ thickness 7'2"; By
hand level I made it 7'10".

The lower layer has crinoid stems
in it. The upper 2 layers bear corals
and at the Genesee contact on the north
side of the dam these are very
abundant in a shaley ls.

The rock when weathered has a
tendency to split into large or small
angular, irregular, blocky fragments
so that with a single blow

a large boulder can be shattered to bits.

A short distance south up the hill and then east along the first dirt (private) road at the top of the hill and 3/4 of a mile along it is a quarry in the Sully. The stone is as fragmentary that the ordinary quarrying methods are not feasible and after blasting it can be shovelled up. (not actually seen in operation but judged from appearance & condition by Duck).

Aside from corals I saw few fossils in the Sully. P. rana.

A little east of the house in the woods the Sully appears to have only 5 layers. The lowest is 23" the next 5", the middle one is 31", the next 22", and the last 2" = 7' 1"

The stones in the Sully are not calcareous.

On the lower the surface is marked by fucoid or matted masses of stem-like forms.

The stone is the usual blue grey on a fracture surface.

395

Aug. 9.

Fauna of hard ls band: at 731 paces above the Pichenor:-

S. pennatus cc
C. mucronatus c
Wood
C. scitulus
C. coronatus
P. rana

This 4" of stone is very hard and is a grey ls. Also that at the falls at 583 paces

Below this band in the shales with Grammysia, etc were noted S. pennatus, C. vicinus and C. incissurata, A. erectum?

In the shaley ls. just below the harder 4" layer are:-

√ S. concava c
S. rectum
√ S. perplana c
√ T. carinatus c
√ C. coronatus c
√ S. grandosus cc
Crinoidea
C. boothi
Chaetetes
√ C. bellistriata
P. rana
Bryozoa
√ A. spiriferoides
√ P. iowensis (r).
T. exiguus
√ R. princeps ?
~~Pal. constricta~~
√ Pal. constricta

396

This zone with S. concava is about 1 foot thick and overlies the concretionary bed of about 10' that carries T. carinatus and Pleurodictyum. This foot is divided into two parts, the lower & very fossiliferous part is a shaly ls., the upper is characterized by abundance of S. pennatus but few other forms and is only 4" thick. The upper 4" is the most resistant and well displays the gentle undulations of the rock.

Ls at 583 paces restudied:—
Fauna—
~~C. coronatus~~
Taonurus c } Found in the 1' below the ls.
P. rana (huge)
T. carinatus
S. pennatus

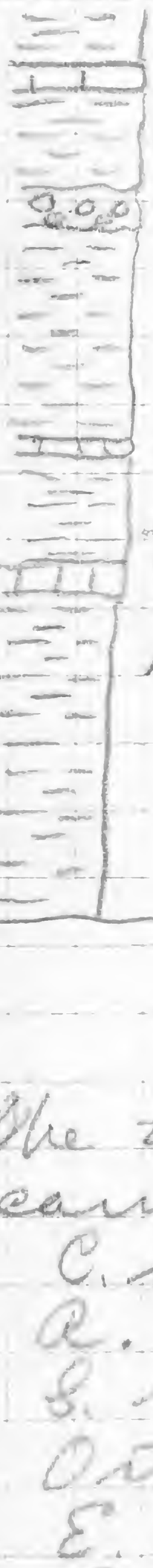
This ls is one foot thick and contains
S. pennatus T. carinatus
P. rana huge C. setigerus
S. granulosus
C. coronatus

It is a very hard even grey ls., 1' thick and may be the Menteth. It is overlain by 10' shales carrying T. carinatus, concretions and Pleurodictyum, as is the Menteth at Menteth ravine. The ls is nodular in local patches, contains some shale and also Taonurus. It dips rather strongly, I should judge about a degree or more with the stream and this is its only appearance. It is exposed from the ledge of the falls to about 30 yds upstream. On a weathered face irregular (flint-like) masses stand out, also some of the fossils, ~~and these~~ two phenomena were noted in the

397

Meantte.

50 paces upstream from Meantte? comes a calcareous band & forms rocks (5') Strata contain C. impressa and 30 paces above this comes the band with S. concava. The section is about as follows:



sh 2'
ls + sh with S. concava 1'
sh 4-5' with O. undulata, Gruningera, etc.
1'-2'
sh with S. cancellata 9'
1'+ with C. impressa + very fossiliferous S. grandaeva cc
sh with concentricus, D. carinatus + Pleurodictyum 4'?
"Meantteth" ? 1'
Rotten
barren
shales brittle + massive - dark blue gray (like Earville sh. 270'
Stream level below falls.

The 2' of shale on the S. concava band carry:

C. Lucernatus c
R. reticularis (first appearance) cc
S. meantteum
Orthoceras sp.
E. lucerna
P. varia c
Par. hamiltoniae
C. incisa rata
R. spiriferoides rr
N. undulata
C. bottii
Pal. concentrica
S. permutatus c
Fav. hamiltoniae
M. concentrica
M. multilineata
Cantrogyra (multiple)
D. carinatus rr
C. recticulus
Pal. tenuistriata

This shale is coarser and very gritty to the teeth. It contains a few concretions, one of which contained a great deal of Pholadite

398

At 731 paces the 4" L on the S. concave bank forms a cascade, at 083 paces it is about 21 or more feet above the "Mentelle". At 814 paces the conglomerate bed below it is at stream level & the L/is about 4' above stream. This is just under the bridge at 814 paces. At 544 paces it is 8' above the stream. At 948 paces it is still 8' up but beginning to drop. At 987 paces the conglomerate layer is again on the stream. At 1046 paces the bank is 1½' above stream level. At 1150 it is 2' above stream level. At 1179 and for 47 paces the concretionary band is exposed in the bed of the creek. at 1351 the concretionary band is 5' above stream.

The coarse shales here below the concretionary bed yielded:-

G. arenata
Pal. concentrica
T. subemarginata
L. solenoides
P. discoideum
C. coronatus
Lingula sp.

T. concentrica cc.
L. nancyi ?
P. lanceolata
Lehigodus sp.
N. obliquatus
B. lada
Grammysia sp.

At 1410 the L. concave band is 10' above stream level. 1570 paces it is 8' above stream. 1650 paces the concretionary band goes below stream level. (1603) paces the L. concave band is in the stream bed & forms a 2' cascade. At 1788 paces the 3' of sandy shales on the S. concave band forms a long flat in the stream bottom. All sandy shales exposed for 47½ above the L. concave band.

21

399

At this
C. mucronatus c c
L. punctata
A. reticularis c
A. spiriferoides c
Pal. contortiscae
C. incrassata
Pholidops ham?
C. coronatus

S. pennatus c
Productella sp.
P. rara
Par. hamiltoniae
M. concentrica
Lep. hamiltoniae
C. acutulus

The lower 3' are hard, brittle & slightly calcareous; the next 1½' appear to form a transition to the shales above which are softer, slightly calcareous and weather into small fragments and are much more fossiliferous in point of numbers of individuals. Above this 1½' is softer but still retains its jointing.

The beds of shale above carry:-

A. umbonata c c c
P. rara c c
Pal. fecunda
C. mucronatus
C. bentleii
M. pygmaea
N. cordiformis
Orbiculoidea sp.
C. incisa
S. perplana

S. pennatus
S. granulosus
N. triquetra
C. bellistriata
D. consobrinus
M. concentrica
Pholidops ham.
C. coronatus
A. spiriferoides

The S. granulosus & D. consobrinus cease above the sandy band. They become very abundant just below the sandy band.

1831 in stream bed:-

A. umbonata
C. bellistriata
A. spiriferoides

S. pennatus
D. consobrinus

400

1860-1919 — Listed at 1919 paces the following were found Phol. hamiltoniae
Pal. secunda
C. bellistriata
They are almost continuous exposures of this rock to 2185 paces. At 2300 a long exposure in places very high cliffs. Here along the creek 5' up the following are found:-

M. pygmaea
C. scitula
Pholidops bum.
P. rana cc
C. boothi
N. lirata
A. praecumbens?
C. setigera.
Pal. obstructa

The shales here are very dark grey. This rock is exposed for 150 paces. Except for the small exposure in the stream no rock is exposed from 2450 paces to 2560 paces. Here at 2560 R. umbonata is still common This exposure is only 12 paces long but is 120' vertical.
2272-3050 listed. At 3091 paces the following species were seen:-

R. umbonata cc
C. bellistriata
Aviculopecten sp.
S. pernatus
M. pygmaea
N. corbuliformis

The shales here are very dark grey. This rock is exposed for 150 paces. Except for the small exposure in the stream no rock is exposed from 2450 paces to 2560 paces. Here at 2560 R. umbonata is still common This exposure is only 12 paces long but is 120' vertical.
2272-3050 listed. At 3091 paces the following species were seen:-

R. umbonata
P. carinatus (small)
P. rana
Pholidops hamiltoniae
C. rudemanites
A. praecumbens?
N. corbuliformis
C. bellistriata

S. andrewsi
N. oblongata
R. spiniferoides
S. inventum
B. granulosa

At stream level the shale is hard and in places is a ls. containing S. rectum. Above the stream the rock is soft + dark.
In the ls. (thin band at stream level)

G. reticularis
S. rectum
R. vanuxemi
C. mucronatus
S. granulosus

This Atrypa fauna extends for about 3' above stream level, then comes the Ambocoelia fauna with

C. mucronatus
A. praeumbona
M. subalata
A. umbonata
T. carinatus
Orbiculoidea sp.
C. bellistriata
C. scitulus
P. rana c
Pholidops ham.
N. lirata
N. corbuliformis
N. concinna
L. laura
M. subumbona?

Shales at 3325 – 3448

P. hermes.
Eridophyllum
S. audaculus c
C. bellistriata
A. spiriferoides
P. rana.
S. inaequistriata
S. junia
S. granulosus
A. princeps
T. subemarginata

3448–3531 hiatus

3531 – 3730'

A. reticularis
P. rana
Bryozoa
S. junia?
C. mucronatus
S. granulosus
S. inaequistriata
C. incrassata
A. spiriferoides
O. parvula
S. audaculus
C. boothi
Camarotoechia sp.
C. pennatus

at 3650 paces about 30-35' of Marcou are displayed under the Tully. It is a light grey rock containing many concretions and lenses of lst. which contain the fossils. From here to about 12' below the Tully a. reticulus & Spirifers with S. rectum & Endophyllum prevail.

At 3735 paces - S. concava, & D. limbata can be added to the list of species. Tornatus, R. vanuxemi, M. concentrica 3860 paces to bottom of dam.

Tully makes another falls beyond and behind the village

August 9.

Just outside of Geneva along the lake Road on the east side of the lake and under the Lehigh Valley bridge is an exposure of Cardiff shales which in the lower 5' are blue black in color on the surface when fresh but on a fracture section are a very dark grey. The shales give a grey streak. Fossils are rare but C. setigerus, B. leda, Leiorhynchus sp., P. fragilis were noted in the first 5'. Orthoceras sp. There are a little more than 20' of shale exhibited. On the surface it weathers to a very light grey and where leached an olive color, even in section.

Retrospect on Kashong Creek, Moscow

Above the Tichenor comes a very fossiliferous band for about a foot, then several feet of hard, sandy (?) calcareous shales, followed by calcareous and very fossiliferous rock which is succeeded for a long interval by rather unfossiliferous shales. Prolonged collecting however would probably bring to light from these a good Pelecypod fauna. In these shales at the 3rd falls is a ls like the Menteth & on this shales with T. cornutus, capped by a band of calcareous stone bearing S. concava. Upon this is a long series of shales containing a fauna characterized by Atrypa reticularis & Stropheodonta. This is interrupted about 40' (?) from the top by a zone with L. laura and A. praeumbona. Below the Atrypa zone is a long Ambocoelia zone. Just under the Tully however about 12' shale with L. laura & S. tullius.

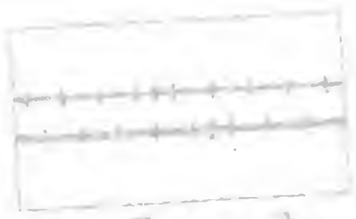
4036

CONVENTIONAL SIGNS

CULTURE
(printed in black)


rivate or
on road


Trail or
path


Railroads
and stations


Electric
railroad


Tunnel


Wh


State line

County line

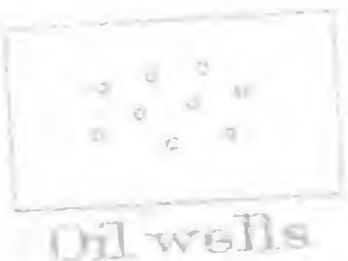

Civil township
or district line


Reservation
line

Land grant
line

rs


Tanks and
oil reservoirs


Oil wells

Mine or
quarry

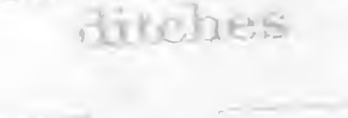
Prospect


Shaft

Levee

Streams

Falls and
rapids


Intermittent
streams and
ditches


C
anic


Sand and
sand dunes


Intermittent
lake


Glacier
(as shown by contours)


Spri

RIE
Stony Point
WEST SENECA
West Seneca
Creek
Ebenezer
Reserve
Smoke
South
Roland
Woodlawn Beach
Blasdell
Branch
Windom
Rush
HAMBURG
Bay View
Big Tree
Steelton
Athol Springs
Hamburg Sta.
Abbott Road
EAST HAMBURG
East Hamburg
Orchard Park
NEW YORK CHICAGO AND ST. LOUIS R. R.
MICHIGAN SOUTHERN R. R.
ERIE R. R.
ELECTRIC R. R.
ROCHESTER AND PITTSBURGH R. R.
N. Y. C.
PENNSYLVANIA R. R.
BUFFALO AND JAMESTOWN DIV.
(BUFFALO DIV.
700
800

culture
ds, and

The hill on the right has a rounded summit
ing spurs separated by ravines. The spurs

CONVENTIONAL SIGN

CULTURE
(printed in black)


Private or poor road

Trail or path


Railroads and stations


Electric railroad


Tunn


and
es
ouses

State line


County line


Civil township or district line


Reservation line

ens


Tanks and oil reservoirs

Oil wells

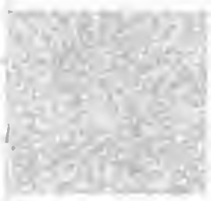
Mine or quarry


Prospect

Levee


Streams


Falls and rapids


ngs or
d debris


Sand and sand dunes


Intermittent lake


Glaci
(Or shown by

403a

Stony Point

I E

WEST SENECA

HAMBURG

EAST HAMBURG

West Seneca

Creek

Seneca Ebenezer

Creek

B14

Reserve

Smoke

South

Roland

Townline Road

Cent

Branch

B13

a

Blasdell

Milestrip Rod

Windom

Woodlawn Beach

Bay View

Big Tree

Steelton

Athol Springs

Hamburg Sta.

Abbott Road

Abbott Road

Orchard Park

Eden

Royer Road

NEW YORK AND CHICAGO AND ST. LOUIS SHORE R.R.

SOUTHERN R.R.

ELECTRIC R.R.

ROCHESTER AND PITTSBURGH R.R.

ELECTRIC R.R.

ERIE R.R.

BUFFALO AND JAMESTOWN DIV.

PENNSYLVANIA R.R.

N.Y.C. & H.R.R.

BUFFALO DIV.

R.R.

600

700

800

50'

78

404c

ED STATES

r gradually away and forms an inclined table-land that i
, versed by a few shallow gullies. On the map each of
- features is represented, directly beneath its position in
f sketch, by contour lines.

The contour interval, or the vertical distance in feet be
e one contour and the next, is stated at the bottom of each
' This interval differs according to the topography of the
a mapped; in a flat country it may be as small as 1 foot;
s mountainous region it may be as great as 250 feet. Ce
. contour lines, every fourth or fifth one, are made heavier
) the others and are accompanied by figures showing alti
r The heights of many points—such as road corners, sum
surfaces of lakes and bench marks—are also given on the


LAKE ERIE
573
Clover Bank
Wanakah
Weyer
Walden Cliffs
Idlewood Sta
Lakeview
North Evans
Water Valley
HAMBUR
S
SOUTHERN DIV
MICHIGAN AND ST
CHAUTAUQUA
AND N.Y.C.
ERIE
DIV
CEM
B M
Eighteenmile
Creek
Pike Creek
Avery Creek
590
586
607
663
700
766
794
796
808
650
682
625
690
723
747
749
748
741
722
705
691
644
724
737
769
798
791
779
800

403e

City or village

Roads and buildings

Ruins Cliff dwelling

Metaled road (distinguished on recent maps only)

Priva

Dam

Dam with lock

Canal lock (paved towpath)

U.S. township and section lines and located corners

Bench mark
(Temporary bench marks shown by brown cross and black figures without lettering)

Cemeteries

Church, School (distinguished on recent maps)

Coke ovens

To oil

RELIEF
(printed in brown)

Figures
(showing height above mean sea level, instrumentally determined)

Contours
(Contours showing depth of water overlaid in blue)

Depression contours

Wash

Cliffs
(or shown by contours)

Mine dumps

Tailings or mining debris

gradually away and forms an inclined table-land that

404

Spirifer
Cryptonella
P. flabellum
A. decussata
A. princeps ?
~~Cordiola~~
Leiopteria sp.

D. laevatum
Platyceras sp.
Crinoid plate ~~in C~~ observed
in Tichenor is probably
Gennaeocrinus nyssa
D. sculptilis

Above the Tichenor are grey shales, breaking & weathering into the gen fragments. Near their base at many locali and at the base A. umbonata is very abundant.

Note: There are masses of Cs.? in some of the Tichenor blocks that appear slightly and like some of the calcareous concretionary rocks below, in texture. Their pockets & patches are very fossiliferous at times.

July 14.

Cardiff Shale — Exposed in the low cliffs along the shore directly behind "Bob" Smith's Bay View hotel. Directly behind the hotel the shales are about 8' vertical and are ~~[illegible]~~ grey on the dry weathered surface. In cross-section they are dark-grey with a brownish cast (olive). A cursory examination showed only Styliolina but in great abundance in the layers about 3' above lowest rock exposed (which is about 2-3' above H_2O level). The streak of the shale is brownish grey. In the lowest layers when they were fractured they had a distinct bituminous odor, much like oil shale.

A lens calcareous slab there had many Styliola and also a Spirifer pentated in it.

140 paces south of hotel section is 13' 10" thick. Lower and upper layers have Styliola in abundance. It seems to range throughout the shales exposed here from 10' – 13' 10" other fossils were noted but none are abundant.

N. trigineta ✓ — ✓ Orthoceras? sp.
N. oblongatus ✓ — ✓ Snail (Bucanopsis leda?)
C. setigerus ✓

Some of the layers are quite calcareous ~~notably~~ in the bottom along the H_2O level, forming a bench along the beach. This is not however a significant layer. It smells bituminous in section. The shale at 13' has a brownish cross-section somewhat like that on Oneida ile.

$3\frac{1}{2}$

$\frac{7}{8}$

$\frac{3}{4}$

$3\overline{)6\frac{1}{4}}$

$\frac{10}{10}$ " $= 200$

$5' = 2400'$

$\frac{1}{10}' = 260'$

$3\frac{1}{2}$

$3' \; 6''$

$8'$

$10' \; 10''$

$2'$

18

Much of this ~~Cardiff~~ has the same concretionary structure as seen in the Oneida, [illegible] + [illegible] shales at Hamilton. It is possible that septaria form by cementation in the curved fractures of the shale. Breaking into curved plates

Picture 3 roll 2 Cardiff 140 paces S. hotel

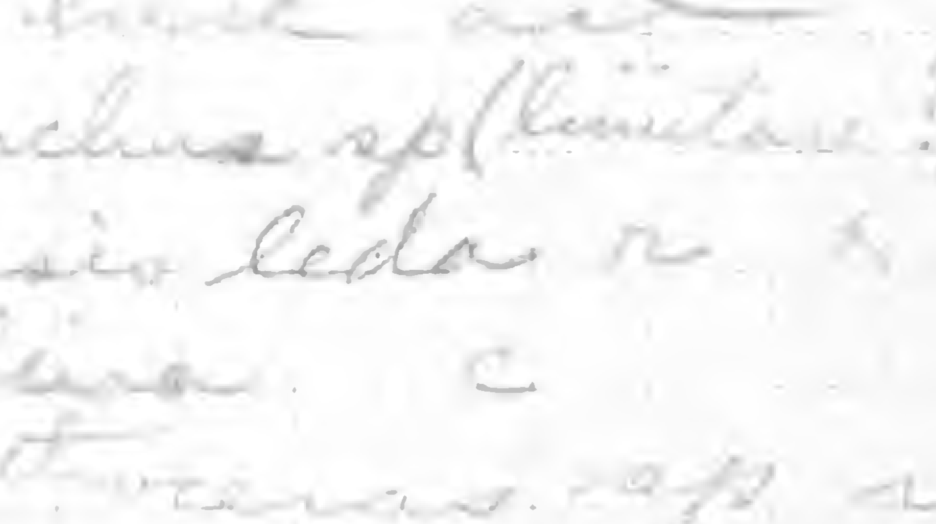
290 paces south of hotel – section excellent about 14' thick and in the upper layers contains fossils. These upper shales are calcareous as a test with acid shows. They do however break about like ~~those~~ below. They weather a light grey when exposed to the wind. Fossils observed here are—

P. rana r ✓	✓ Leiorhynchus sp (limitare?)
S. pennatus r ✓	✓ Bucanopsis leda r x
A. umbonata c ✓	✓ Styliolina c
Chonetes mucronatus r	Orthoceras sp r
C. boothi ✓	

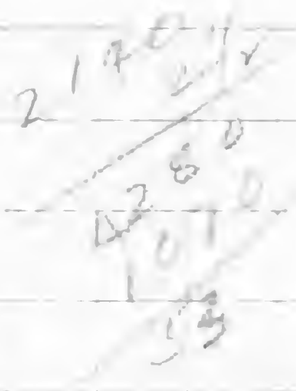
Picture 4, roll 2 Cardiff 340 paces

375 paces south of hotel, on beach.

About 11½' above lowest exposed rock (one foot above water level, total 12½) is a band 2" thick of very calcareous shale with fossils. Then 3½' shale the upper foot [illegible] to [illegible] in cross section. Another is a 1½' band of ls with Leiorhynchus and M. tripuncta. Between the 2 ls layers Styliolina is very abundant.



400 paces below hotel ls ½ band forms top layer under the soil + has C. setigerus



408

2140 paces south of Smith's (Bay View Hotel) exposures of shale with calc again met with and are about 17½' vertically. These are exposed behind Louis' Lake Shore Restaurant. The lower 9' are shale giving a bituminous odor when fractured and bruised.

Section at Athol Springs about 100 yds s of Louis' Restaurant. The Cardiff below this
—— 5'5" shaley ls. is somewhat calcareous.

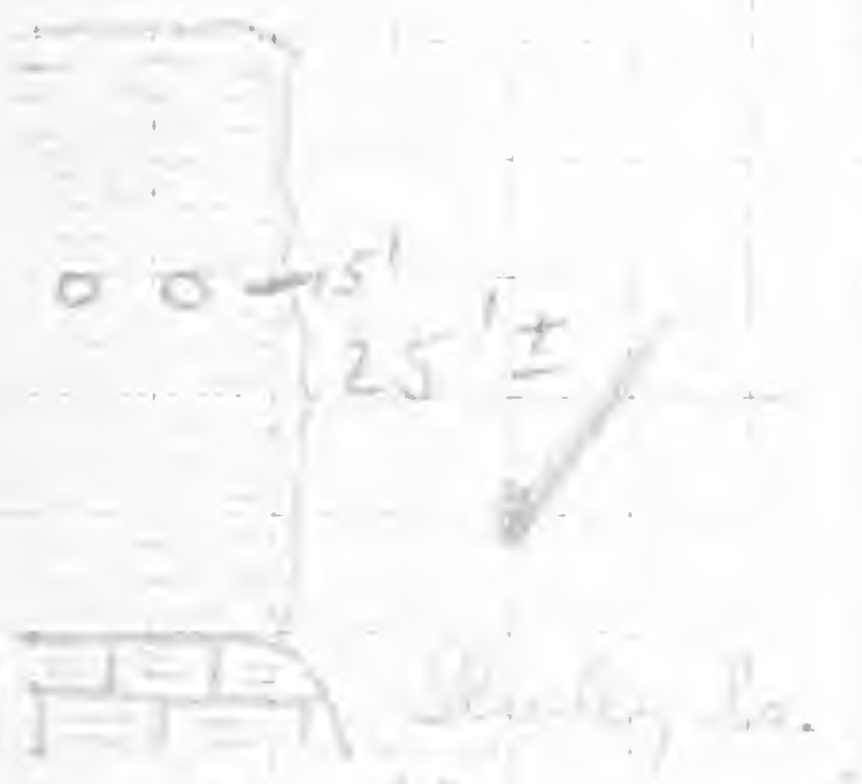
Section a short distance south — between Athol Spr. & Hamburg Park

The 2' calcareous band is succeeded by 10' (here) of very soft shale that crumbles the fragments even smaller than the Cardiff below. This shale like that below effervesces with acid.

This 2' calcareous sh bed at base of Shaw descends 11½' in 1375' which amounts to about 44' per mile as one component of the dip

Just north of Hamburg Park

Ham. sh. —



On top of the 2' shaly ls., which is hard and forms a rising bench all along the shore are soft grey shales that can be crumpled readily to a clay. None fall naturally into thin flakes. The formation as exposed here is not very fossiliferous. On the 2' ls. sh. were noted C. setigerus and L. [illegible]. In the soft shales P. fragilis, ~~and~~ These shales are in strong contrast to the Ludlowville shales above, with their numerous fossils and many courses of concretions. Concretions in this bed at Hamburg Park are confined to about 15' above the 2' band of calcareous sh. They are calcareous and spherical.

A number of concretions were opened but none contained fossils. Some beautiful specimens of S. pennatus were found ~~a~~ in the talus along the cliffs. They were not rounded by waves and their freshness strongly suggested their origin from the Skan. above. These shales are calcareous, effervescing on a fresh fracture with acid.

~~S. truncata c~~
~~B. [illegible] c~~
~~[illegible] (Plant) cc~~
~~S. mucronatum c~~
~~N. oblongatus r~~
~~S. pennatus rr~~
~~N. [illegible]~~
~~P. [illegible]~~

July 14.

Section about 50 yds. S. of Hamburg Park
Hamburg Park is 80 paces north of Avery's

A sandy band of ls. is prominent in the shale, probably terminating it here. In the calcareous band about 14' above beach S. pennatus occurs. In the soft sh. P. rara was found.

Section on Avery's Creek.

Roll 2 Skaneateles

Avery's Creek.

The Stropheodonta bed is about 8" thick here and forming a cascade in Avery's Gully. It is a dark gray ls. with a blocky or concretionary structure thus weathering into individual blocks or slabs. The fauna is rich and is as follows. — see next page

In the shale (2') underlying the Stroph. bed there are found also those in the ls. snails being abundant. Especially abundant however is P. rara. Other fossils are —

C. [illegible] var calliteles   R. [illegible]
T. [illegible]   Platyceras sp.
S. pennatus
[illegible]

411 411

Strophalosia bed fauna

S. truncata cc ✓
B. leda c ✓
G. subulatum c ✓
Brana rc ✓
C. boothi ✓ ✓
Snails (Bypona, etc) ✓
Lox. hamiltoniae rc ✓

H. oblongatus ✓
H. trifurcata ✓

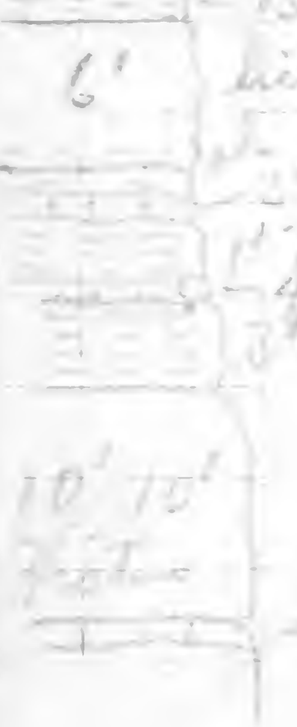
In the few inches of shale on the Strophalosia bed I have small Tentaculites in abundance.

Roll 3 pictures 24 3 Stroph. bed

12

July 15

Avery's Creek cont'd



413

Jy 15 f – specimen with 4 S. pennatus + 2 Athy. specimens belongs here. Shale brownish having the appearance of silty shale, slightly gritty / 15". Only S. pennatus noted.

Owasco Creek

7' below Tichenor – bluish grey shale wet and only "slightly calcareous / falls to a clay when wet / Fossils numerous but only a few brachiopods are easy to extract. Fauna

~~A. spiriferoides~~
~~S. ...~~
~~A. ...~~
S. pennatus – most abundant form in the bed.
A. ...
~~C. scitulus~~

~~N. concinna~~
C. ...
P. patulus
S. perplana

About 4' below Tichenor the shale has many specimens of bryozoa, flat ... possibly Cystodictya (Stictopora)

Also here were noted P. flabellum, P. rava, ~~R. fimbriata~~.

The upper shales near the Tichenor are red from pyrite weathering. The upper 2' of Ludlowville yielded

~~S. pennatus~~
~~T. carinatus – abundant~~
~~A. coral~~
~~C. scitulus~~
~~P. flabellum~~

N. concinna
Large Spirifers
~~A. ...~~

Tichenor – fossils
S. granulosus – abundant
Mytilarcas large
A. spiriferoides
Rhipidomellas
A. large Actinoceras

} on upper surface of blocks

1/81 = 650

76 = 3251 108 yds

1740)10

560
2
1120
140
13600
5780

424/1760 = 21/88

630/1740 = 315/870

63/172

32/86 = 16/43 = 8/22 = 4/11

108) 430 yds

Moscow

About 1' above Tichenor is shale with A. umbonata c, C. scitulus c, A. reticularis c, A. spinosa. Then follows about 8" to 1' of calcareous shale with many corals (small), many P. rana; D. consobrina, S. granulatus, Palaeoneilo tenuistriata ?, Pterinopecten, Rhipidomella vanuxemi ? C. [illegible]

A set of joint here is N69W vertical and irregularly spaced from 1½'-5' ? & an intersecting set at S65W-vert. The total thickness of the Moscow is measured here as 26' 9" or 27'.

The shales from the top of the coral bed up to 12'10" are quite barren of fossils except for P. rana. At 12'10" there is a 2" band of concretionary ls and this by a few inches of sh (exact dist? not more than 6") There then succeeds a band of concretionary calcareous shale (ls) forming a cascade in the brook. This is about 6" to a foot in thickness, the exact amt. cannot be ascertained. This bed (B) P. rana, Ambocoelia, Spirifer subumbonus ?

Between the upper bed of concretions and the Gannundewah ls. fossils are fairly abundant. The concretions do not contain many fossils altho one had a specimen of M. subumbona ? Fossils occurring in the shales here are:—

M. subumbona ? C. setigerus
L. laura ?
P. rana
C. Audaculus
C. [illegible]

Wenonah Cliffs Section

Description – The layer 3'10" corresponds to Jy 15a of Avery's gully and has A. spiriferoides + corals in abundance. The 9" layer is Jy 15b with P. iowensis + M. subarcata. 1'5" shale is Jy 15c, Shaley ls 3½" is same as Jy 15d, Then the 7'8" corresponds to Jy 15e, 4'8" calcareous sh. corresponds to Jy 15f. but is better exposed. The S. pennatus occurring just below this bed are very large.

Joints here read N68E + N71E (to be corrected)

The Pleurodictyum bed occurs here 6' below the ls band with P. iowensis that is exposed in the water and

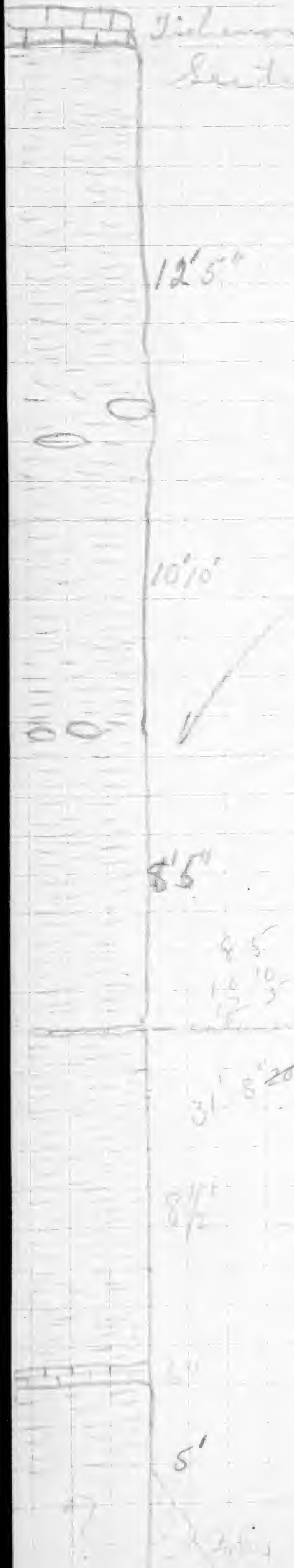
appears to be about a thin band of ls or shale. Fossils are numerous

P. [illegible]	E. spiriferoides
S. gr[illegible]	S. [illegible]plana
S. [illegible]	[illegible]formis
C. [illegible]	[illegible] demissa
Crinoid stems	Platyceras
P[illegible]	Diaphorostoma
Corals (sp)	

These exposures are 1/4 of a mile north along the shore from small road leading down to shore, which leads from the main highway to the shore directly in front of the Waubakee country club. To locate take a line due north from the Waubakee County club and intersect it with shore 1/4 mile (520) paces from the intersection of this line with the shore will lead to the Pleurodict[illegible] beds.

July 16.

Tileman
Section at Lakewood



The lowest shale is exposed for only about 2' the rest being covered by 3' of talus. On the exposed / defined band about 6" of shale more calcareous than that below so that it stands out slightly in relief. This also contains L. pennatus and P. nana. This is probably the same shale as at Jy 15 f. Then follows 8½' shale and then a 1½'-2" band of limestone containing [illegible] with M. pygmaea. The stone is quite compact [illegible] places the stone is lined on the seams with small gypsum crystals. This is succeeded by 8'5" of soft shale with concretions. The shales [illegible] contain A. spiriferoides, L. pennatus, L. laura? [illegible] concretions bed N. [illegible] bed [illegible]. About [illegible] concretions with the shale [illegible] were found. 33' from the base the shale have fossils and the [illegible] collected about 100 yds N of the beach. Fossils here are

P. [illegible] rc   L. laura r
S. [illegible] rc   Pholidops r
L. pennatus c   T. [illegible] rc
L. laura c
P. [illegible] c
A. spiriferoides c
A. [illegible] c
P. tenuistriata ? r

8 6
8 5
1 10
1 5
1 2
3

 421

Many of the shales contain pyritized concretions of irregular shape.

17½' of shales follow — Then comes the Salmon ls 10" thick 2' below Salmon ls [illegible] and C. [illegible] are found. The [illegible] shales here exposed here are not calcareous except for the concretions.

Moscow Division

In the Salmon are 10½' of shale with many Aptophyllums and on these shales 2' band of ls. with C. [illegible] and [illegible] followed by shale in the bottom of which just above the 2" band of ls. are small crinoids like those found above the 8. concretions zone in [illegible]. The shales here are slightly calcareous. At the top of the Mos at the 11th step (22') the shales have M. [illegible] and C. [illegible]. There are at least 5' more of Moscow actually measured. The [illegible] comes in here in about 2' more, making a total of about 27'–30' for the Moscow.

The M. [illegible] may be a prominent [illegible] in the [illegible] says they are found just below the [illegible] 6' [illegible] for M. [illegible] + 2' [illegible] for C. prominent [illegible]

422

Wilden Cliffs

[illegible]

18 Mile Creek

Section west of highway bridge

The bed of rock is a limestone ledge that forms [illegible] in the water. This bed contains P. [illegible] ✓ ~~S. [illegible]~~ ✓

~~[illegible]~~ ✓ Corals ✓

~~[illegible]~~ ✓ ~~M. [illegible]~~ ✓

P. constricta ✓ Platyceras sp. ✓

[illegible] sp. ✓ [illegible] ✓

~~[illegible]~~ ✓

P. [illegible] ✓ C. scitulus ✓

According to [illegible] this is one of the [illegible] beds (lower). It is about 6" thick on the Creek.

Next above this there is a shale bed 11" thick containing:- P. rana c; S. pennatus c, T. carinatus r, A. spiriferoides r, C. umbonata, Palaeoneilo sp., C. scitulus

This is followed by 4" of hard calcareous stone which is somewhat gritty. This stone forms a ledge in the stream bed along the cliff. Here are found S. fissurella, C. Boothi, c, P. rana, Aulopora, S. pennatus c. Fossils are not as common in this bed as in those below. Spyroceras, B. leda.

Section of Tidewater Bldg.

Tidewater 10' - 1"

40' slab

32'

Concrete

Lo. with L. perimeters

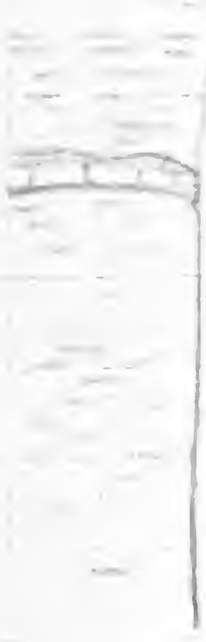
7' 6"

4" Lo
11" shale

Here follows 7½' shales with
Syrocrinus nuntius C. bellistriata ✓
S. pennatus Ostracoda
P. punctulifera ✓ A. umbonata
Rana (?) C. scitulus
Small tentaculites

These shales in the lowest 1 ft. are somewhat calcareous and form a third ledge in the stream bank. They have yielded the lower 1' many individuals of P. rana

There follows a calcareous ash band of about 8" with many S. pennatus. Some have very long arms & pinnules. The only other fossil noted in this band is P. rana. About 40 (or 45) ft. [illegible] section 50 yds. upstream from highway bridge.



Fauna of Kellarsville 13' below Tichenor & in an interval of 5'. Here the shale breaks in larger masses, and is not calcareous. This is the same horizon as seen at Lakewood. Fossils here are:

C. boothi r
A. umbonata cc
P. rana
S. pennatus cc
L. laura? c
A. spiriferoides rc
D. lineatum vr
S. perplana
Taeniopora r
T. carinatus r.

Ostracoda
Schuchertella vr
R. vanuxemi vr
Aulopora
Productella
Crinoidea
Phillipsia
Bryozoa
Cyrtina hamiltoniae

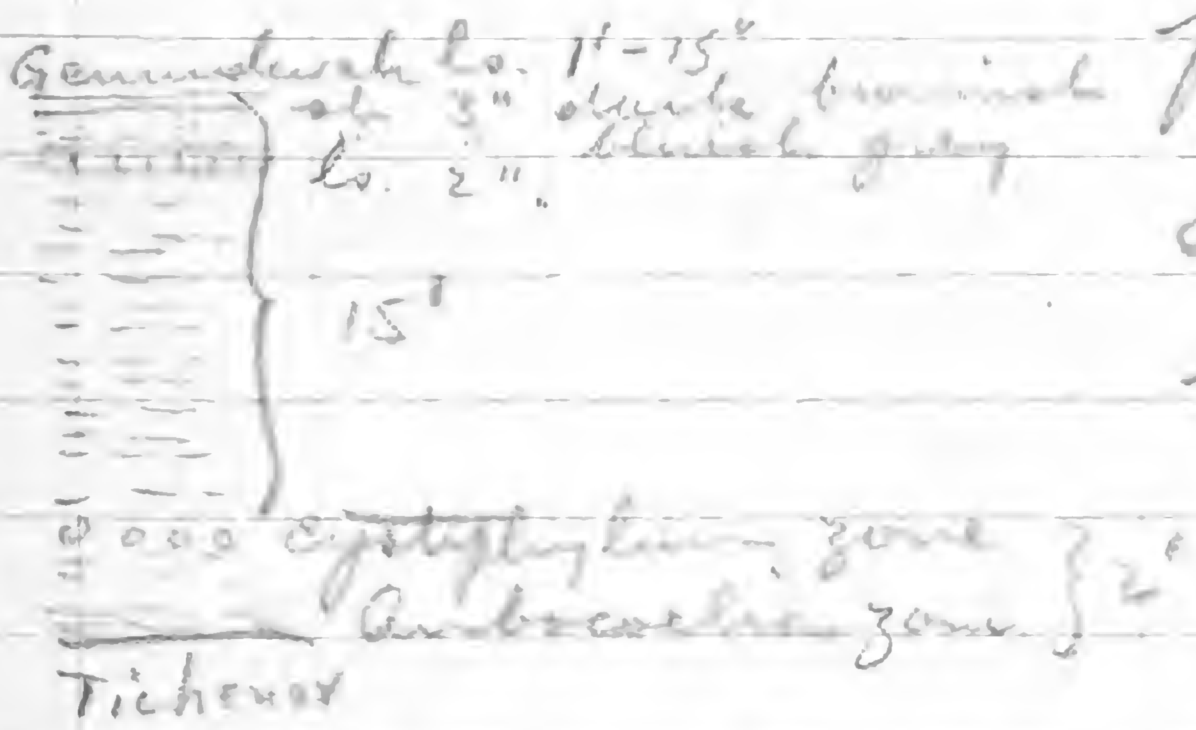
A great resemblance to the soft Eaton shale
Moscow sh 18 mi Ck.

Lowest shales at contact are crowded with Ambocoelia. In these are also
A. spiriferoides
D. consobrinus?
S. perplana
S. pennatus

Upstream about 1/4 mile the Tichenor has become thicker & is here 20" thick. The upper surface often contains many fossils, as large Mytilarcas, A. ? ?, R. fimbriata, P. flabellum, E. ? D. lineatum, Platyceras
a denudata M. ? ?
corals & bryozoa, S. granulosus. Sometimes this upper surface has strings or band-like masses of pyrite. Huge heads of F. hamiltoniae often occur crowded in the rock and at any horizon in it. 2' above the Tichenor is the zone of Cystiphyllum and Atrypa spinosa. The section is exactly ?' thick here. Just below the ?

425

is a 3" shaley band of rather calcareous shale. Below this there are 3" of shales like the Moscow below and below these 2" of concretionary ls. I was not able to work out the zones of the Moscow clearly at all. Above the Cystiphyllum & Streptelasma zones fossils, everywhere that I have examined the rocks are rare. The M. subumbona was here again found 2-4' below the Genundewah ls. This and a small Chonetes setigerus were the only fossils noted.



 426

July 17

Species observed in the Tichenor on about miles of lake shore south of 18-mile Creek.

P. obiformis
S. deltussa }
C. boothi } In shale clinging to Tichenor
P. rana }
R. fimbriata }
C. granulosus.
Platyceras sp.
D. lirieatum
Modiomorpha sp.

P. iowensis
Favosites
Cryptonella ?
Unitrypa scalaris
S. cofkava (juvin) ?
Hederella
D. sculptilis

427

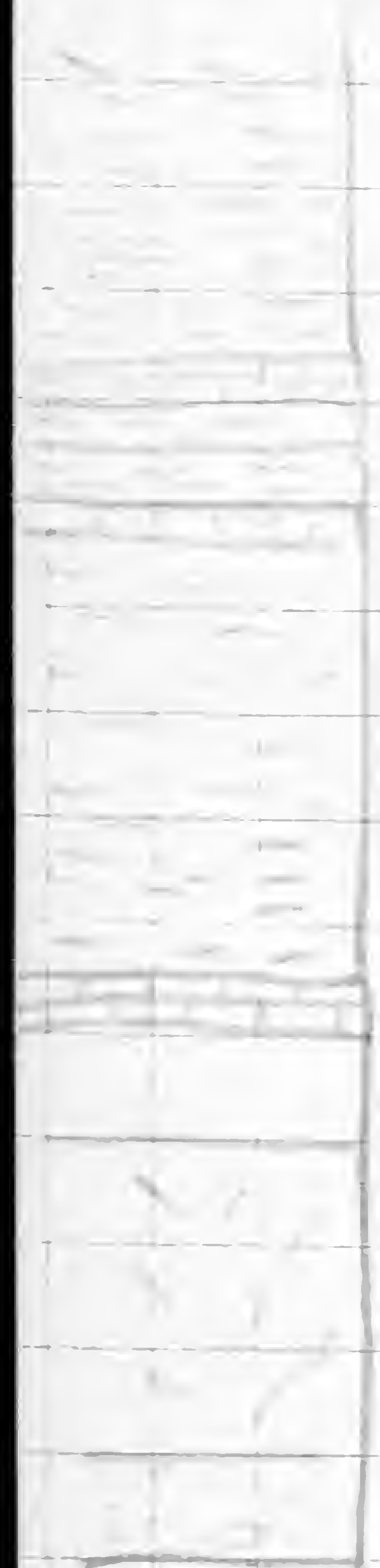
880 yds = ½ mile

440 = ¼ "

375
3
1125 ' = 1/5 mile
5280

428

Section 500 paces [west] on shore south of Highland on the lake — above stair case



West River shale

8" Genundewa ls.

impure sandy calcareous (3")

11'8" Moscow shale } 11'8"

Tichenor 15"

7' Ludlowville

15' talus

5' beach
Water level

In the calcareous band below the 8" Genundewa ls. were found a trilobite pygidium & a small shell possibly Ambocoelia. In the ls. above the brown shale Lingula spatulata was discovered?

The shale between the Genundewa ls. and the Tichenor — when rubbed on a rough surface leaves a brown streak, the Moscow leaves a white streak.

The West River and Portage shales continue up the side of the hill for about 50' & [illegible] of the shale above the ls band with L. spatulata ? as fossils and ~~black~~ containing large concretions. [illegible] black shale [illegible] West River in the Middlesex shale [illegible] over the Cashaqua shales with large concretions.

 429

6 10 paces south of highland – only bottom of [illegible] [illegible] 3' above Trilobites

[illegible]

In the shale on top of the Trilobites there are many [illegible] fragments; with
Cornulites [illegible]
Crinoids
G. [illegible]
[illegible] there is a 4' band of ~~[illegible]~~ [illegible] with
[illegible] [illegible] ?
[illegible] [illegible]
[illegible] [illegible] ?
[illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]

Section 920 paces south of Highland

Sandy dark ls 8"
Dark shale alternating with thin [illegible] dark ls. 5"
1" dark ftls, concretionary with C. vicinus?, M. subtumida

11' 10"

Ls
Shale in 13"
[illegible]

15' hiatus

water level

Explanation

Sandy dark ls - lens lines [illegible]
8" shale — thinly laminated - dark
1" ls — ostracods & S. fissurella
1' concretionary ls - conchoidal fracture & parting
M. subtumida, C. vicinus?

1532 paces south of Highland the top of the Lebanon is 3' 9" above water level. The Murfreesboro is estimated to be about 11' thick here.

Section 1332 paces south of Highland

The upper one foot of Tichenor shales here are crowded with the Hystericus shells. In the lowest ~~[illegible]~~ shaly band of 4" were found P. rana, Pholidops, [illegible], D. concavus, crinoids, like those seen [illegible] band as at Avery's. In the shales just below the 1' band, under the [illegible] below the Grindstone was found P. rana and C. mucronatus.

54 paces south (1686) the first 2' of shale on the Tichenor had few fossils then came foot of sh. with A. umbonata crowded, packed in, & also A. spiriferoides & C. mucronatus. Just below ~~[illegible]~~ ~~[illegible]~~ a shale 2' [illegible] were found Cystiphyllum corals & (Eridophyllum?) [illegible] above & also in the band. The 2" concretionary layer is absent here. A. spin[illegible] several small, Platyceras [illegible] & P. [illegible] & S. [illegible] were also found. In the shale above this S. [illegible] was seen.

The Cystiphyllum, Athyrea zone is exactly below the 9" [illegible] Cystiphyllid [illegible] corals [illegible] the 4" bed. In this 4" bed a Cystiphyllum [illegible] 2½ in diameter was found.

432

1710 paces South of Highland

Bevindennet 8"
brownish shale 9"
Ls 1'

10'8"

coal zone 1½'
Tebo about 2' above 1½'.

Mason

About 1½' above coal zone were found A. umbonata, A. spiriferoides and a small Spirifer, quite probably S. tullius, & a Ambocoelia (M. Athenian)? The calcareous band here has disappeared but the coal mark the horizon.

2080 paces South of Highland

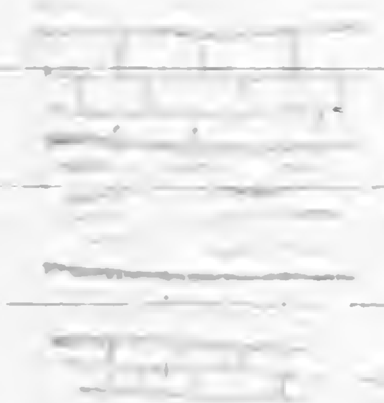
Seminuda only Ls. 7"
8" Brownish sh
3" calcareous sh.
5" Ls.
8'8"

Tebo — already in the water

1630 paces below Highland the Mason is 9' 7" thick and the Tebo is about 6" under water. The band below the brown shale is 6" thick & there are 6" of gray shale between the two.

 433

3100 paces below Highland (5300)
[illegible] Creek outlet shaly 3 1/2' of
the [illegible] are exposed
[illegible] 6'
West R. 12'



[illegible] ls 8"
11" [illegible]
5' shale
- ls 2"

35"

Section at Mouth of Creek
2600 paces from Highland

west R sh.

[illegible] ls 5"
2" [illegible] sh
6" shaly ls splitting into chips
20" hard ls [illegible]

10'10"

3 9

[illegible] [illegible]
Tichenor at H2O level

6" calcareous sh [illegible] zone
11" shale with [illegible] C. [illegible]
[illegible] [illegible]
Cystiphyllum, [illegible]

434

The coral head is well exposed in the bed of Pike Creek where it enters the lake.

435

July 20 1928

Pike Creek

Measured from top of Moss Creek [illegible] shale is 10' 10" thick + 50 [illegible] = 11' 7"

1 — Fossiliferous zone [illegible]
4" [illegible] with [illegible] — [illegible]
[illegible] 2"
[illegible] (1") [illegible]
[illegible]
[illegible] 3" —

A. [illegible]
B. [illegible]
C. [illegible]
P. [illegible]
Cythere [illegible]

D. [illegible]

Next 4" — [illegible]
[illegible]

[illegible]

[illegible]

H. [illegible]
C. [illegible]

[illegible] 1 – 2" thick.

A. [illegible]
D. [illegible]
D. [illegible]
C. [illegible]
C. [illegible]
C. [illegible]
P. [illegible]
[illegible]


8"
9 3/4"
11"
4'3"
5"

436

437

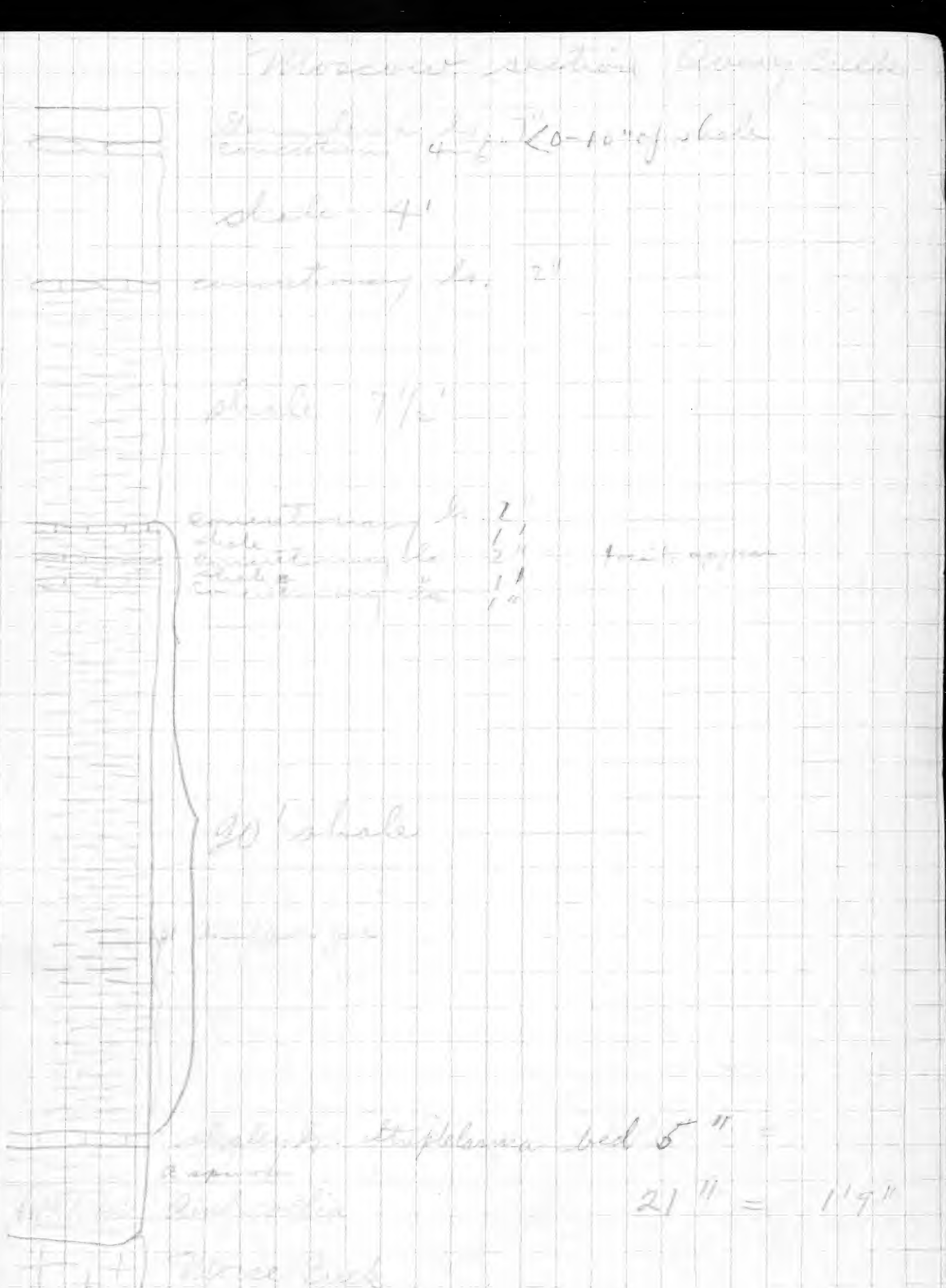
[illegible] shale [illegible] mostly [illegible] the [illegible] Pipe-
[illegible] [illegible] [illegible]
[illegible]. The [illegible] appear to be
[illegible] [illegible] mostly [illegible].

6, [illegible] [illegible] very [illegible]
S. pectinella   C. [illegible]
P. nana   Ambocoelia (praeumbona)

7. Brown shale caps the [illegible] in places the layers of Styliolina [illegible] bed 6. Styliolina layers [illegible] petroleum odor prominent.

Pike creek section consists of one foot and inches of very fossiliferous shale representing shale from Ambocoelia beds to base of S. coralline zone. Here follows 4-6"? of calcareous shale representing, perhaps, S. coralline zone. Shale above this is mostly barren, but contains some limestone layers. The section closes with of shaley ls. nearly devoid of fossils. Brown shale above it may be Genesee but is not like it lithologically.

438



439

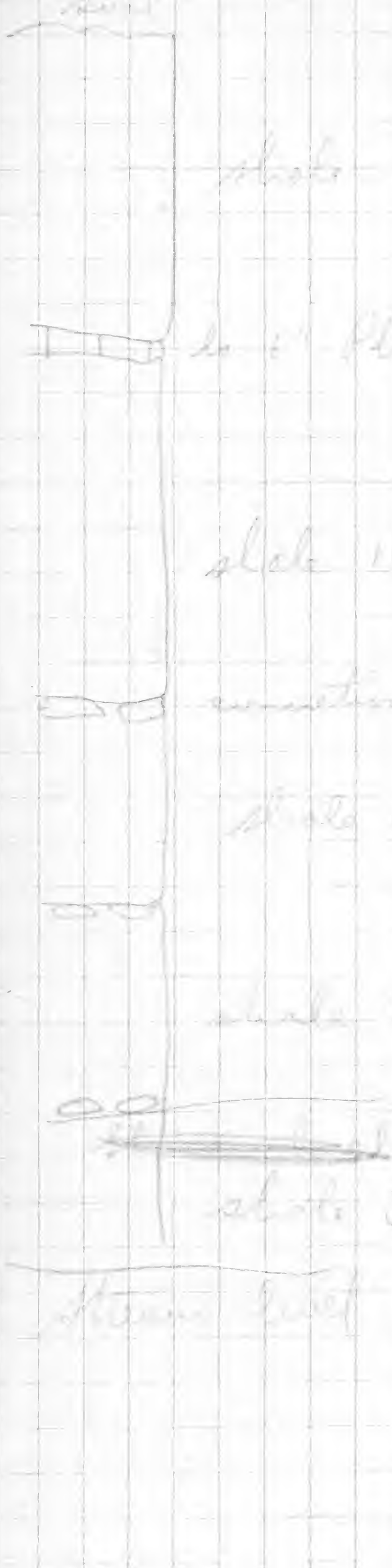
440

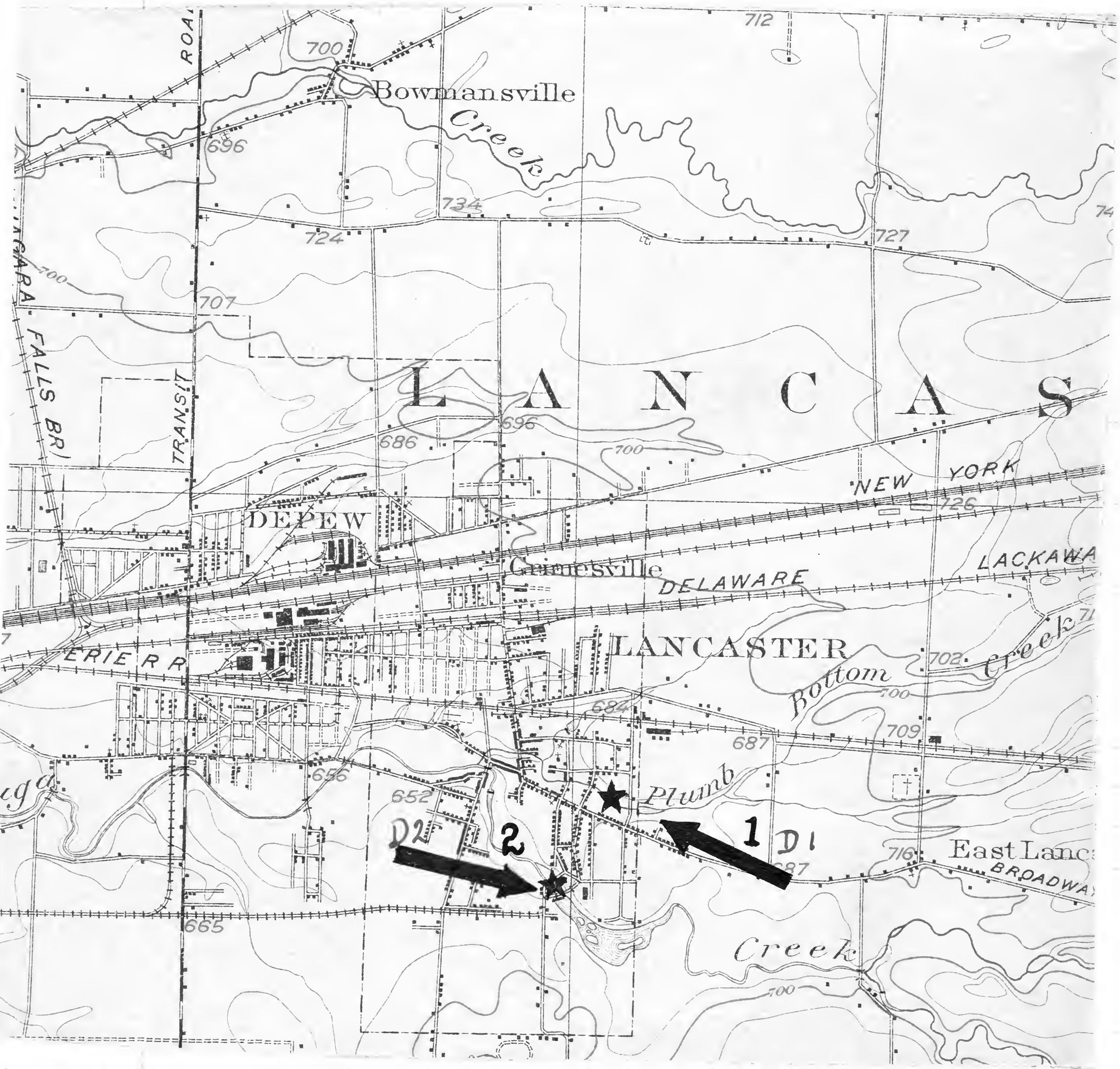
Buffalo Creek

Section about 1¼ miles upstream from Blossom. E. ponderosa swarming at 500 paces downstream from Bridge. Placenticeras bed is about 22' above stream level at 300 paces. The Placenticeras band is a hard surface limestone about 6" thick. The Placenticeras is quite common. Other fossils are -
V. texanum (?) E. lepidus (?)
G. subrostrata (?)

At the bridge & ... at the location of the bridge, about 700' A.T.

Placenticeras bed is at 500 paces upstream from abandoned ford. 31' [illegible] two or three layers of concretions. The exact identity of these could not be determined but they are probably at about the horizon of the Placenticeras bed.




Bowmansville
Creek
712
700
696
734
724
727
707
LANCASTER
DEPEW
Cheektowaga
Depew
Lancaster
NEW YORK
726
DELAWARE
LACKAWA
ERIE R
Bottom
Creek
702
684
709
687
656
652
Plumb
D2
2
1
D1
716
East Lanc
BROADWA
665
686
Creek

July 18.

Lancaster N.Y. — Stafford ls. Cayuga Cr.

Under the Lake avenue bridge a 10" layer of very hard ls. which is very fine grained and grey. Fossils here are Ambocoelia, C. mucronatus, L. limitare? Upstream and between the two bridges just below the dam are 2 layers of ls., the lower one downstream 10" thick, the upper one at the dam is of 2 layers amounting to 1'. Thus about 22" of ls. are exposed between the two bridges. On the uppermost bed under the street-car bridge there is a 2" layer of calcareous shale with crinoid stem fragments and C. mucronatus.

Stafford ls.

275 paces below the Court Street bridge [illegible] col. were found small outcrops of Marcellus shale below the Stafford ls. The thickness of the Marcellus exposed here is about 1'-2'. The stone is not the typical black fissile shale with paper thin bedding but is dark grey some of it weathering brownish. It has a conchoidal fracture and concretionary structure. 200 paces below the court street bridge the shale is black with a [illegible] and is calcareous.

The upper shale below the Stafford is gritty and more compact and is very calcareous. It [illegible] a calcareous shale. The stone [illegible]

is also quite fossiliferous. The species observed are:-
Lunulicardium curtum
L. [illegible]
Orthoceras (probably Geisonoceras subulatum)
P. fragilis
N. triquetra
P. linckblaeni
C. mucronatus
A. umbonata?
One of the layers is a limestone 1" thick
(150 paces) E. directly below the lowest layer of the Stafford noted which is [illegible] paces downstream, the Marcellus 1½' thick is a soft brownish grey shale. The total thickness of Marcellus exposed must be 3-4'.
The lowest bed of the Stafford is 18" thick and is a hard grey ls. crowded with small Ambocoelia. Also present here was C. scitulus. This first bed is 18" thick. Then follows a bed 19" thick in the lowest portion of which occurs corals in the shale parting. The next 6" are compact & hard then the rest is composed of ls that appears hard but when struck falls to flat plates. On the pocket (solution) surfaces of these blocks the parting between these plates appear. Also contains. In places the rock has a decided concretionary structure. In the ls. which breaks into plates well preserved specimens of C. scitulus are very abundant.
The uppermost bed exposed is just below a small [illegible] about 50 yds. from [illegible] Street bridge. It is hard and compact and has many fossils

443

It is a grey ls, with a flinty fracture. It was not possible to hand level this ravine with the result that the thickness could not be measured. Luther gives it as 8'5" which seems high. I would make the layers exposed here 5'6" to 6' in thickness. Probably all of the rock is not now exposed. Thin layers of shale are found between the partings of the major beds.

Cardiff sh.

At the junction of Little Buffalo and Cayuga Creeks there is shale in the creek bed but above this a stratum of rather hard ls. forming a ledge. This layer is probably the same as that which divides the Cardiff from the Skaneateles at the Erie Lake shore. The shale here is calcareous. The shale in section is a dark grey and is about 6" thick. The ls. is about 10 15" thick. Fossils observed in the ls are:-

P. rana — S. pennatus ✓
Styliolina ✓ — S. subulatum?
At. reticulata? ✓ — P. laevis? ✓
L. laura? ✓ — C. boothi

A set of joints spaced about 5' here reads N 72 E and an intersecting set, less regular reads N 22 W. The shales above the ls are darker in color than those below. Correct

444

When wet the rock has been exposed to the weather it crumbles to small chips and thus leaves a very irregular surface. About 3/4 of shale is exposed above the low in the creek upstream from the highway bridge. It is brownish gray in color and when struck with the hammer it leaves a brownish streak on paper. It is quite calcareous with acid. Large rectangular blocks in the streambed brought from above are of a similar kind, showing the nature of the rock above.

 445

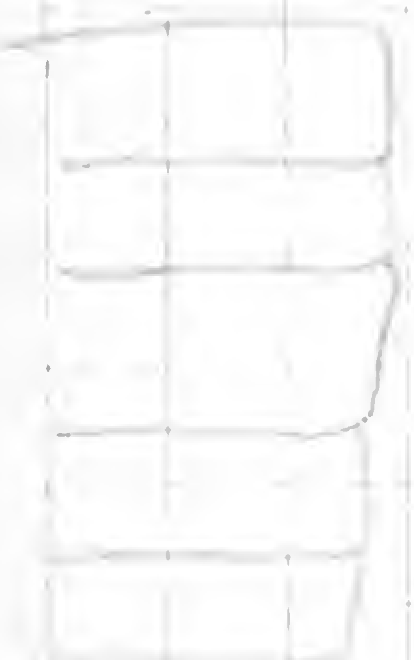
July 31

Le Roy

Onondaga – exposed below the second RR bridge downstream from the dam at Main Street. Shaly [illegible] limestone [illegible] [illegible] of Onondaga fossils [illegible] within 6" of the contact.

Stafford and Marcellus

Stafford exposed in the dam about 3' above the level of the water. [illegible] consists of 11" hard [illegible]. It is smooth [illegible] [illegible]. [illegible] with a splintery fracture [illegible] [illegible] chocolate [illegible] [illegible] [illegible] 11" [illegible] [illegible] splitting [illegible] [illegible]. [illegible] 11" gray [illegible] [illegible] [illegible] [illegible] [illegible] Below [illegible] [illegible] [illegible] [illegible]



Cliff at Le Roy

The upper [illegible] of the Stafford in contact with the [illegible] is shaly and abounds in [illegible] and a small [illegible]

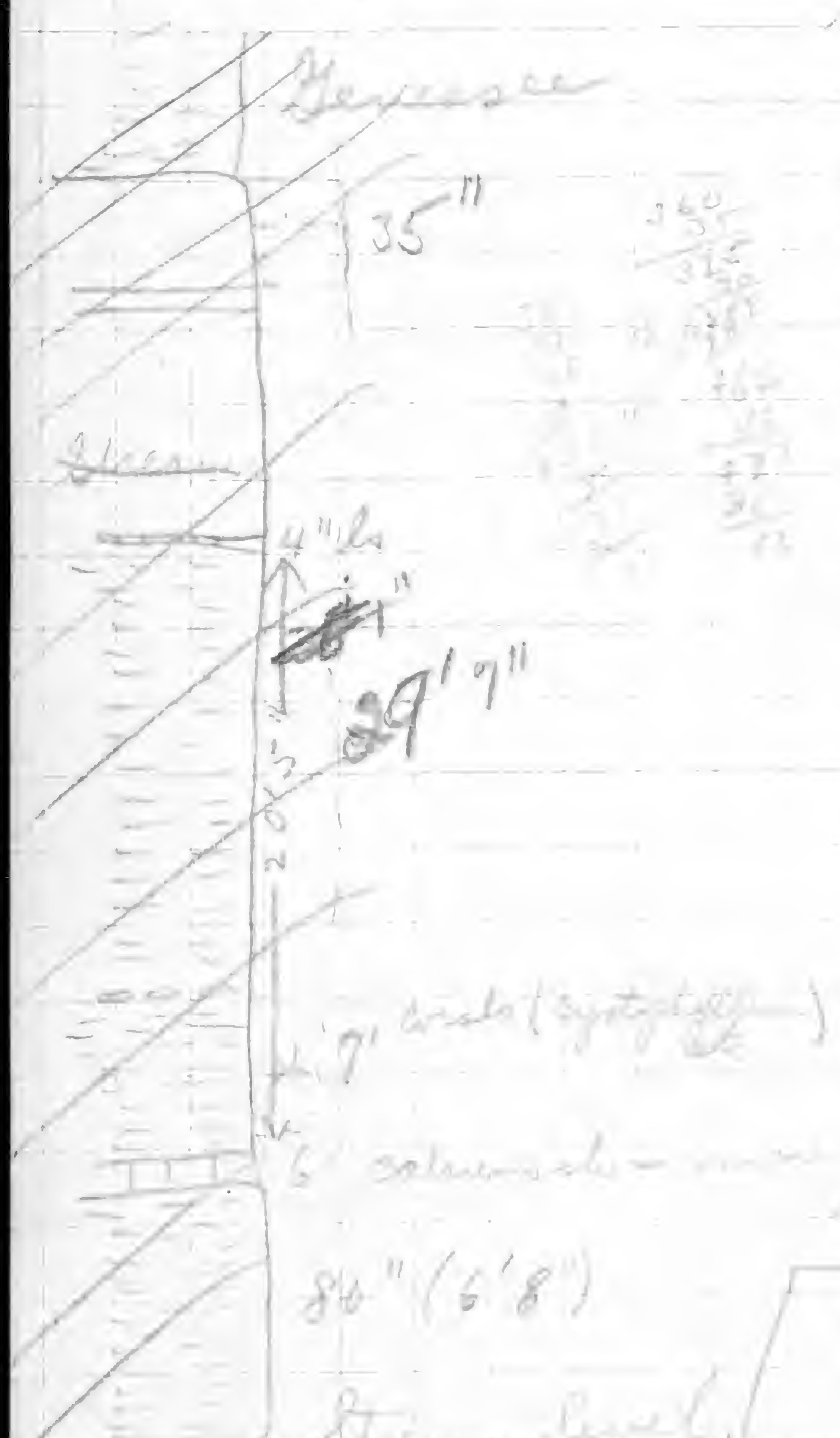
446

July 26.

Section on Little Beards Creek — Moscow horizon

950 paces from the intersection of the north branch of Beards Creek with Little Beards Creek Moscow rocks is exposed as grey calcareous shales that crumble easily into small fragments. On the opposite side of the river at the same place (950 paces) the shales have a concretionary structure and fall to small pieces or fragments when exposed to the sun. In this one foot of shale exposed here fossils do not occur abundantly. C. bothi and ?. [illegible] were the only ones seen.

In the shales above this one foot the following fossils were found, just under the 6" calcareous shale band were found Phacops hamiltoniae, C. [illegible], Ambocoelia sp. These shales when weathered have a greenish or olive [illegible] [illegible] T. [illegible] A. reticularis, small corals,



In the 6" calcareous band are abundant [illegible] of C. [illegible], small corals (Streptelasma)